CALIFORNIA HIGH-SPEED TRAIN

Los Angeles to Anaheim

Supplemental Alternatives Analysis Report

July 2010

California High-Speed Rail Authority

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CALIFORNIA HIGH-SPEED TRAIN PROJECT EIR/EIS

Los Angeles to Anaheim Project EIR/EIS

Supplemental Alternatives Analysis Report

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July 2010

Table of Contents

Figures

Tables

Abbreviations / Acronyms

AA.....Alternatives Analysis
ACHD .....Anaheim Colony Historical District
Amtrak .....National Railroad Passenger Association
ARTIC .....Anaheim Regional Transportation Intermodal Center
Authority .....California High-Speed Rail Authority
Caltrans.....California Department of Transportation
CEQA .....California Environmental Quality Act
CP.....Control Point
EIR .....Environmental Impact Report
EIS.....Environmental Impact Statement
FRA.....Federal Railroad Administration
FTC.....Fullerton Transportation Center
GIS .....Geographic Information Systems
HSR .....High-Speed Rail
HST .....High-Speed Train
KPH .....Kilometers per Hour
LA-A.....Los Angeles to Anaheim
LAUS.....Los Angeles Union Station
LAX.....Los Angeles International Airport
LOS.....Level-of-Service
LOSSAN.....Los Angeles to San Diego Passenger Rail Corridor
Metro .....Los Angeles County Metropolitan Transportation Authority
Metrolink .....Southern California Regional Rail Authority
MF .....Multi-Family
MPH.....Miles per Hour
NEPA.....National Environmental Policy Act
OCS .....Overhead Contact System
OCTA .....Orange County Transportation Authority
Piper Tech .....City of Los Angeles C. Erwin Piper Technology Center
PTC.....Positive Train Control
ROW .....Right-of-Way
RRC .....Regional Rebuild Center
RTP.....Regional Transportation Plan
SCAG .....Southern California Association of Governments
SF .....Single Family
TOD .....Transit-Oriented Development
UP .....Union Pacific
VMF .....Vehicle Maintenance Facility

1.0 Introduction

The California High-Speed Rail Authority (the Authority) is studying alternative alignments for a high-speed train (HST) section between Los Angeles and Anaheim. This study incorporates conceptual engineering information and identifies feasible and practicable alternatives to carry forward for environmental review and evaluation in the Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) for the Los Angeles to Anaheim (LA-A) section of the California HST Project. The LA-A HST Section is shown in Figure 1.3-1.

This document is a supplement to the Draft Alternative Analysis (AA) Report issued for the LA-A HST Project in April 2009. Since April 2009, modifications to the alternatives and design options have been made as coordination with local cities and agencies has progressed and additional engineering detail has become available. This report presents the changes from the earlier Draft AA Report and references the material and text that has not changed.

1.1 California HST Project Background

Same as Section 1.1 in 2009 Draft AA Report

1.2 Los Angeles to Anaheim Project EIR/EIS Background

Same as Section 1.2 in 2009 Draft AA Report

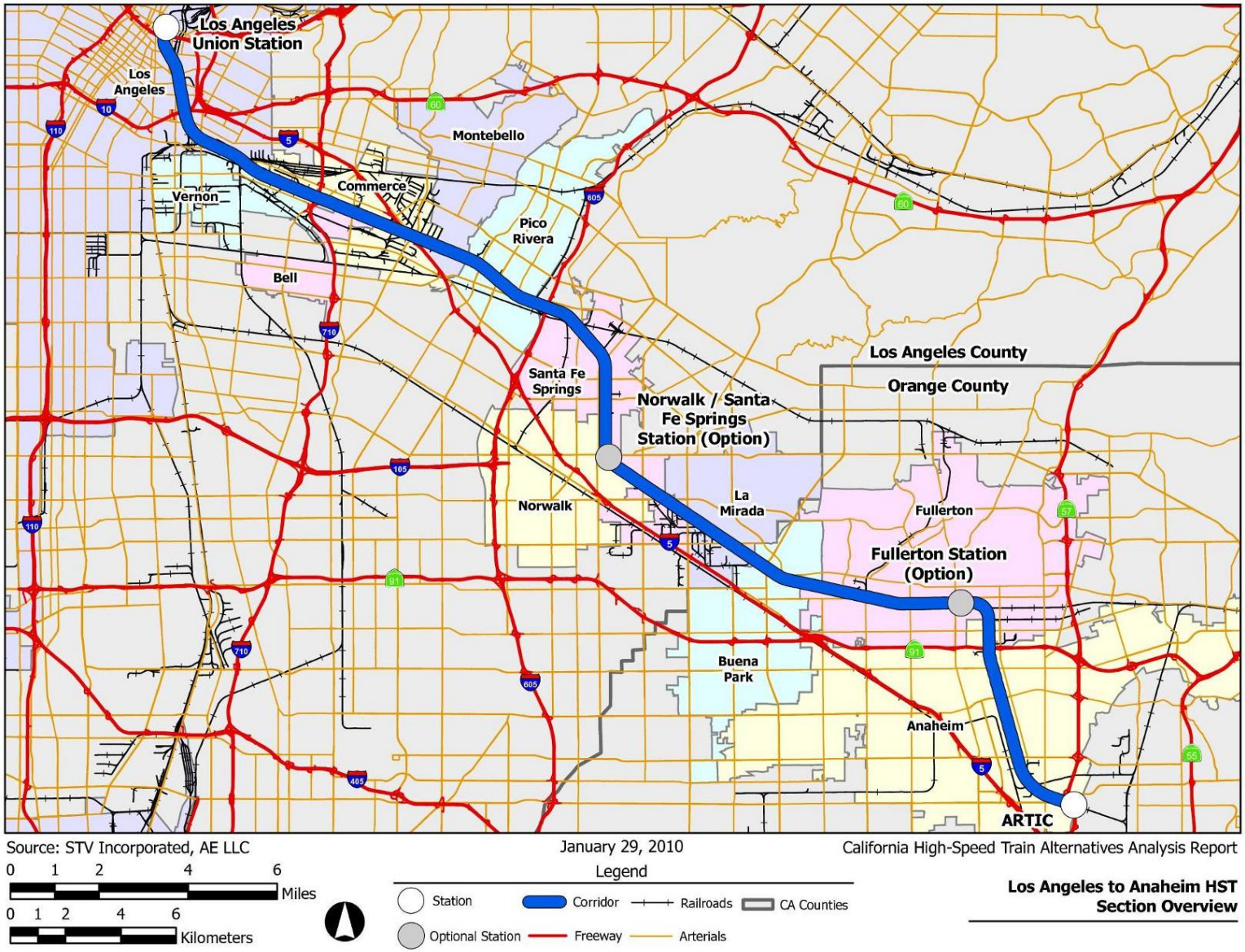
1.3 Alternatives Analysis Report – Purpose and Structure

Same as Section 1.3 in 2009 Draft AA Report with addition of following text:

This document builds upon the Draft AA Report issued for the corridor in April 2009. Modifications have been made to the report as coordination with local cities and agencies has progressed and additional engineering detail has become available. Changes from the Draft AA Report are noted throughout the document.

Section 2.0 describes the evaluation measures used for the AA process. Each of the project alternatives is described at a corridor-wide level of detail in Section 3.0. Section 4.0 defines and evaluates options for key subsections of the Dedicated HST Alternative, and Section 5.0 defines and evaluates key subsections of the Consolidated Shared-Track Alternative. Section 6.0 defines and evaluates Vehicle Maintenance Facility Options, and Section 7.0 summarizes the results of the AA analysis.

Figure 1.3-1 LA-A HST Section Overview



2.0 Alternatives Evaluation Process

Section 2.0 in 2009 Draft AA Report with introductory text replaced as follows and subsections modified as noted:

The process for this study involves the creation and refinement of alternatives, through a series of processes that are intended to compare alternatives. This study follows a defined alternative analysis process as described in the Technical Memorandum *Alternatives Analysis for Project EIR/EIS, Version 2* (included in Appendix A), and uses both qualitative and quantitative measures that reflect a mixture of applicable policy and technical considerations.

The techniques that are used to gather information, develop and compare alternatives include:

- **Field Inspections of Corridors** – The potential alignment, right-of-way, and station location are the subject of field inspection by experienced planning personnel, engineers, and analysts with experience in railroad operations, to identify conditions and factors not visible in aerial photos or on maps. Over the course of the study, field inspections become progressively more detailed as the alternatives are refined by the planning and engineering work.
- **Project Team Input and Review** – The project team conducts team meetings to discuss alternatives and local issues that potentially impact alignments.
- **Qualitative Assessment** – A number of the qualitative measures used to describe the alternative alignments are developed by professionals with experience in the construction and operation of high-speed rail and other transportation systems. These measures include constructability, accessibility, operability, maintainability, right of way, public infrastructure impacts, railway infrastructure impacts, and environmental impacts.
- **Engineering Assessment** – Engineering assessments are provided for a number of measures that can be readily quantified at this stage of project development. The engineering assessments can provide information on project length, travel time, and configuration of key features of the alignment such as the presence of existing infrastructure.
- **GIS Analysis** – The bulk of the assessment is performed using geographic information system (GIS) data, which enables depictions of the project's interactions with a variety of measurable geographic features, both natural and built. GIS data is used to assess impacts on farmland, water resources, floodplains, wetlands, threatened and endangered species, cultural resources, current urban development, infrastructure, and oil and gas exploration and production.

Assessment and analysis measures have been developed for each step in the process outlined above. The evaluation measures, as applied, are progressively more technical and quantitative as alternatives evolve.

2.1 HST Project Purpose

Section not included in 2009 Draft AA Report and added as follows:

As a section of the statewide HST system, the purpose of the project is to provide reliable high-speed electric powered train service from Los Angeles to Anaheim and that delivers predictable and consistent travel times. The LA-A section of the HST System will provide greater access and choice of transportation modes, which will increase mobility throughout Los Angeles and Orange counties and contribute to increased mobility throughout California.

Specific project objectives of the HST system within the LA-A section include:

- Improve mobility by relieving the mounting capacity and congestion constraints on Interstate 5 and surrounding freeways through providing a choice of a high speed train transportation mode.

- Improve mobility by relieving the increasing capacity and congestion constraints at the Los Angeles International Airport, John Wayne Airport, and other Los Angeles area airports through providing a choice of a high speed train transportation mode.
- Reduce the capacity constraints and congestion on freight and passenger rail infrastructure along the LOSSAN corridor by providing a choice of a high speed train transportation mode.
- Maximize connectivity and accessibility for passenger rail and transit at Los Angeles Union Station, the Anaheim Regional Transportation Intermodal Center (ARTIC), and an intermediate station in Norwalk / Santa Fe Springs or Fullerton.
- Minimize disruptions to existing Amtrak and Metrolink service.
- Provide a sustainable reduction in travel time between Los Angeles and Anaheim.
- Provide a HST alignment that is feasible in terms of engineering challenges and right-of-way constraints.
- Minimize disruptions to neighborhoods and communities along the corridor by minimizing right-of-way acquisitions, project design effects, and/or the potential for affecting community resources.
- Preserve environmental quality and protect sensitive environmental resources by reducing emissions and vehicle miles traveled for intercity trips in Los Angeles and Orange counties, and by maximizing avoidance and minimizing impacts to sensitive environmental and natural resources adjacent to the LOSSAN corridor.
- Maximize the ridership/revenue potential for Los Angeles and Orange counties by providing reliable HST operation.
- Minimize capital and operating costs related to construction, operations and maintenance of the LA-A section of the statewide HST system.

2.2 HST Design Objectives

Same as Section 2.1 in 2009 Draft AA Report

2.3 Comparison of Project Alternatives

Same as Section 2.2 in 2009 Draft AA Report with exception of modifications to Table 2.2 as follows:

Table 2.3-1 HST AA Evaluation Measures – Project Alternatives

Measurement	Method	Source
A. Land use supports transit use and is consistent with existing, adopted local, regional and state plans, and is supported by existing or future growth areas.		
Development potential for Transit Oriented Development (TOD) within walking distance of station	Identify existing and proposed land uses within 1/2-mile of station locations. Identify if there are TOD districts, a TOD overlay zones, mixed use designations, or if local jurisdiction have identified station areas for redevelopment or economic development	Regional and local planning documents and land use analysis and input from local planning agencies.
Consistency with other planning efforts and adopted plans	Qualitative - general analysis of applicable planning and policy documents	Land Use Analysis. Baseline Conditions Study
B. Construction of the alternative is feasible in terms of constructability and ROW constraints.		
Constructability, access for construction, within existing transportation ROW	Extent of feasible access to alignment for construction	Conceptual design plans and maps

Measurement	Method	Source
Disruption to existing railroads	Right-of-way constraints and impacts on existing railroads	Conceptual design plans and maps
Disruption to and relocation of utilities	Number of utilities diversions	Conceptual design plans and maps
C. Minimizes disruption to neighborhoods and communities – extent to which an alternative minimizes right of way acquisitions, minimizes dividing an established community and minimizes conflicts with community resources.		
Displacements	If possible, number of properties by land use type that would be displaced. Or acres of land within the right-of-way/station footprint, by type of land use: single family, multifamily, retail/commercial, industrial, etc.	Identified comparing the alignment conceptual design drawings with aerial photographs, zoning maps, and General Plan maps.
Property with Access Affected	Identify potential locations along the alignments or at station locations where access would be affected.	Estimated off conceptual design plans and aerial photographs
Local Traffic Effects around Stations	Identify potential locations where increases in traffic congestion or level-of-service (LOS) are expected to occur.	Existing traffic LOS from local jurisdictions
Local Traffic Effects at-grade separations	Identify potential locations at-grade separations where increase in traffic congestion or LOS are expected to occur.	Existing traffic LOS from local jurisdictions
D. Minimize impacts to environmental resources - extent to which an alternative minimizes impacts on natural resources.		
Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected	Identify new bridge crossings required; rough estimate of acres of wetlands, linear feet of waterways; acres and species of threatened and endangered habitat affected; acres of natural areas/critical habitat affected	Measured off conceptual design plans and GIS layers.
Cultural Resources	Identify locations of National Register of Historic Places or California Historical Resources Information System listed properties. For archaeological resources identify areas of high or moderate sensitivity based on previous studies conducted in the study area.	Based on conceptual design plans and GIS layers; Section 4(f) studies and cultural resource records search and surveys.
Parklands	Number and acres of parks that could be directly and indirectly affected. This would also include major trails that would be crossed;	Based on conceptual design plans and GIS layers; Section 4(f) studies
Agricultural Lands	Acres of prime farmland, farmland of statewide importance, unique farmland, and farmland of local importance within preliminary limits of disturbance.	Based on conceptual design plans and GIS layers.

Measurement	Method	Source
E. Enhances environmental quality — extent to which an alternative minimizes impacts on the natural environment.		
Noise and Vibration effects on sensitive receivers	Identify types of land use activities that would be affected by HST pass-by noise and ground vibration.	Results of FRA screening level assessment. Inventory of potential receivers from site survey and aerial maps.
Change in visual/scenic resources	Identify number of local and scenic corridors crossed and scenic/visual resources that would be affected by HST elevated structures in scenic areas and shadows on sensitive resources (parks). Identify locations where residential development is in close proximity to elevated HST structures.	Result of general assessment. Survey of alignment corridors and planning documents.
Maximize avoidance of areas with geological and soils constraints	Identify number of crossings of known seismic faults, acres of encroachment into areas with highly erodible soils, acres of encroachment into areas with high landslide susceptibility.	United States Geological Survey maps and available GIS data
Maximize avoidance of areas with potential hazardous materials	Hazardous materials/waste constraints	Data from previous records search conducted for other projects within study area.
Source: Alternatives Analysis Methods for Project EIR/EIS		

2.4 ALTERNATIVES ANALYSIS METHODS – MAINTENANCE FACILITIES

Section not included in 2009 Draft AA Report and added as follows:

As part of the implementation of the LA-A HST section, a maintenance facility will be sited along the LOSSAN corridor to support HST operations (see Section 6.0 for the analysis). A different methodology is used to evaluate alternative sites for a maintenance facility, as described in the Technical Memorandum *Alternatives Analysis for Siting Maintenance Facilities* (included in Appendix G). The evaluation criteria used to evaluate maintenance facility sites are described in Table 2.4-1.

Table 2.4-1 Maintenance Facility Siting Evaluation Criteria

Measurement	Method	Source
A. Land use supports transit use and is consistent with existing, adopted local, regional and state plans, and is supported by existing or future growth areas as measured by:		
Economic benefits to cities and local communities	Quantitative to the extent possible using available data, addressing both direct and indirect benefits, (e.g., jobs creation with corresponding revenues due to purchases of local goods and services, etc.)	Input from local economic and redevelopment agencies and chambers of commerce.
Consistency with other planning efforts and adopted plans	Qualitative – General analysis of applicable planning and policy documents	Land use analysis and input from planning agencies – utilize approved land use plans and maps obtained from the jurisdictions along the HST corridor, and conduct interviews with City and County planning staffs to evaluate the HST consistency with adjacent land uses
Availability of local labor force to support employment needs	Quantitative to the extent possible using available data	Current unemployment data; regional employment growth projections; and input from local agencies, chambers of commerce, and local labor unions
B. Construction of the alternative is feasible in terms of engineering challenges and right-of-way constraints as measured by:		
Capital and operating costs	Availability of potential locations offered to the Authority that could meet the Authority's maintenance facility siting requirements	Requests for Expressions of Interest for Maintenance Facilities issued as a public notice requesting the community and/or interested parties to identify potential locations that could meet the Authority's maintenance facility siting requirements.
Constructability, access for construction; within existing transportation ROW	Extent of feasible access to alignment for construction	Conceptual design plans and maps
Disruption to and relocation of utilities	Number of utilities affected	Conceptual design plans and maps
C. Minimize disruptions to neighborhoods and communities – extent to which an alternative minimizes right-of-way acquisitions, minimizes dividing an established community and minimizes conflicts with community resources as measured by:		
Displacements	If possible, number of properties by land use type that would be displaced. Or acres of land within the right-of-way/station footprint, by type of land use: single family, multifamily, retail/commercial, industrial, etc.	Identified comparing the alignment conceptual design drawings with aerial photographs, zoning maps, and General Plan maps.
Local Traffic Effects	Identify potential locations where increase in traffic congestion or LOS are expected to occur.	Existing traffic LOS from local jurisdictions

Measurement	Method	Source
D. Minimize impacts to environmental resources – extent to which an alternative minimizes impacts on natural resources as measured by:		
Waterways and wetlands and nature preserves or biologically sensitive habitat areas affected	Identify new bridge crossings required; rough estimate of acres of wetlands, linear feet of waterways; acres and species of threatened and endangered habitat affected; acres of natural areas/critical habitat affected	Measured off conceptual design plans and GIS layers; Section 404(b)1 analysis
Cultural resources	Identify locations of National Register of Historic Places or California Historical Resources Information System listed properties. For archaeological resources identify areas of high or moderate sensitivity based on previous studies conducted in the study area.	Based on conceptual design plans and GIS layers; Section 4(f) studies and cultural resource records search and surveys
Agricultural lands	Acres of prime farmland, farmland of statewide importance, unique farmland, and farmland of local importance to be displaced	Based on conceptual design plans and GIS layers
E. Minimize impacts to environmental resources – extent to which an alternative minimizes impacts on resources as measured by:		
Noise/Vibration effects on sensitive receivers	Identify types of land use activities that would be affected by maintenance activities	Results of screening level assessment: inventory of potential receivers from site survey and aerial maps
Maximize avoidance of areas with potential hazardous materials	Hazardous materials/waste constraints	Data from previous records search conducted for other projects within study area.
Source: Alternatives Analysis for Siting Maintenance Facilities		

2.5 IDENTIFICATION OF ALTERNATIVES TO BE CARRIED FORWARD

Same as Section 2.3 in 2009 Draft AA Report

3.0 Project Alternatives

Section 3.0 in 2009 Draft AA Report with addition of fifth project alternative – Consolidated Shared-Track Alternative and modifications to subsections as noted.

3.1 Development of Project Alternatives

Same as Section 3.1 in 2009 Draft AA Report

3.2 Compliance Issues for HST Operations

Same as Section 3.2 in 2009 Draft AA Report

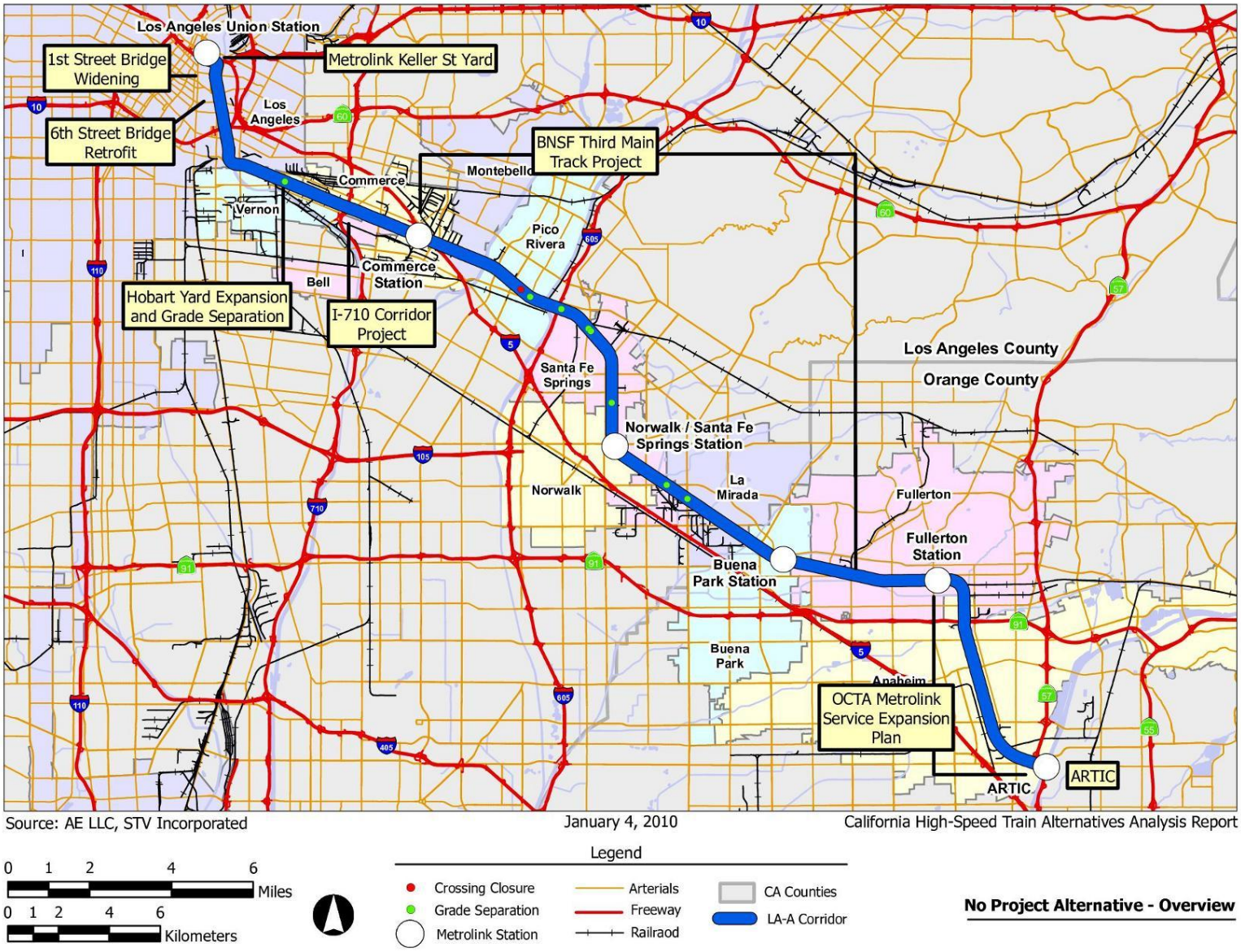
3.3 No Project Alternative

Same as Section 3.3 in 2009 Draft AA Report with addition of future projects as noted below and shown in Figure 3.3-1:

Future Projects included in No Project Alternative:

- Metrolink Keller Street Yard
- Widening of First Street Bridge *(Addition)*
- Seismic Retrofit of Sixth Street Viaduct *(Addition)*
- BNSF Hobart Yard Expansion and Access Grade Separation
- I-710 Corridor Project *(Addition)*
- BNSF Third Main Track and Grade Separation Project
- OCTA Metrolink Service Expansion Program
- Anaheim Regional Transportation Intermodal Center (ARTIC)

Figure 3.3-1 No Project Alternative – Overview



3.3.1 Metrolink Keller Street Yard

Same as Section 3.3.5 in 2009 Draft AA Report

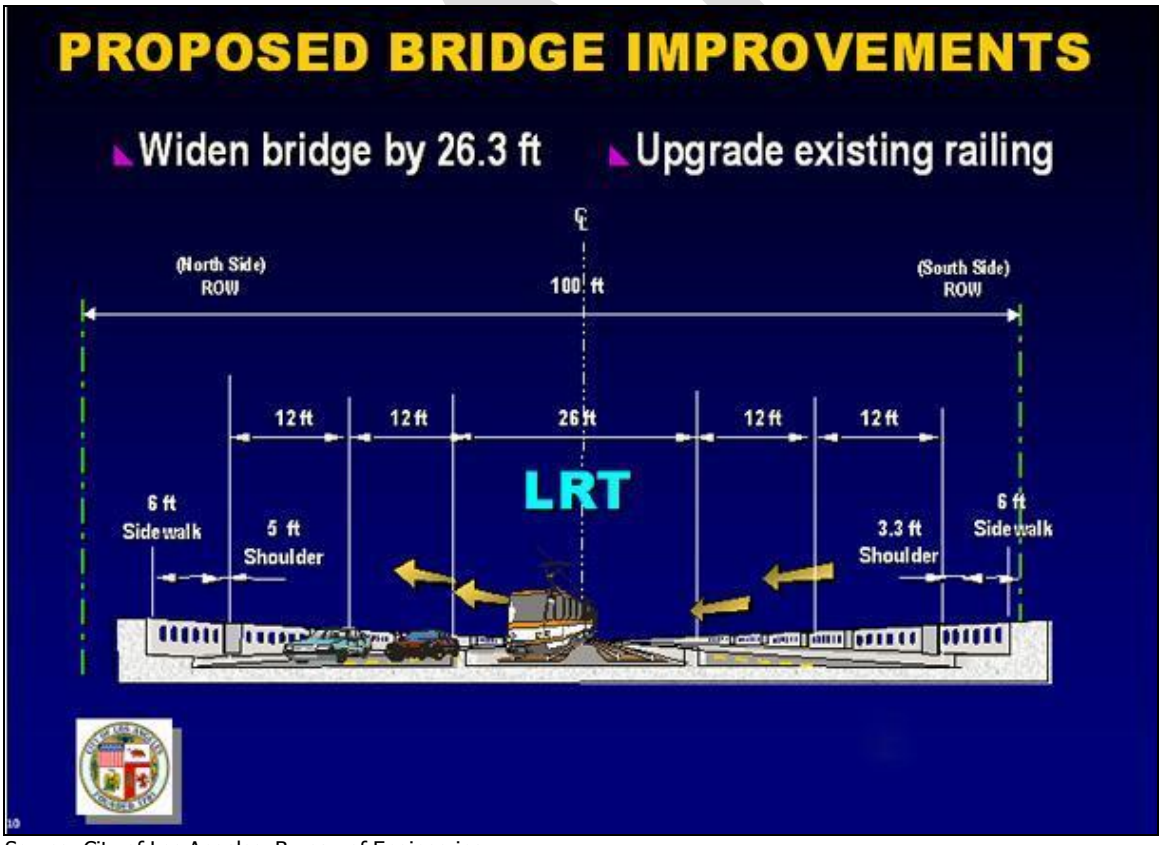
3.3.2 Widening of First Street Bridge

Section not included in 2009 Draft AA Report and added as follows:

The City of Los Angeles is widening the First Street Bridge to ease impacts from the Metro Gold Line Eastside Extension, spanning from Alameda Street in downtown Los Angeles to Atlantic Boulevard in East Los Angeles, operating along First from Alameda Street to Gless Street. The bridge deck is being widened by approximately 26 feet (7.9 meters) to the north to accommodate the operation of the Gold Line along the bridge's median. The bridge is being widened between Vignes Street and Clarence Street. First Street is also being widened to the north between east of Mission Road and Clarence Street and from a northerly extension of South Garey Street to Vignes Street to match the realigned westbound lanes of the widened bridge.

The expansion of the First Street Bridge was originally scheduled to take place from 2005 to 2007. The Metro Gold Line Eastside Extension opened in November 2009, but the bridge expansion is still under construction as of June 2010. The proposed cross-section for the reconstructed bridge is shown in Figure 3.3-2.

Figure 3.3-2 First Street Bridge Widening – Proposed Cross-Section



Source: City of Los Angeles, Bureau of Engineering

3.3.3 Seismic Retrofit of Sixth Street Viaduct

Section not included in 2009 Draft AA Report and added as follows:

The Sixth Street Viaduct over the LOSSAN corridor and Los Angeles River is being retrofitted to meet current seismic standards. The viaduct is a reinforced concrete structure with steel arches, and serves as a main east-west artery carrying two lanes of traffic in each direction over the Los Angeles River, Santa Ana Freeway, several railroad tracks and surface streets. Phase I of the bridge's retrofit was completed in 1995. Phase II of the retrofit is currently under study, with the Draft EIR/EIS released for comment in May 2009. Several alternatives are being studied, including retrofit of the existing structure and replacement with a new bridge. All alternatives span the LOSSAN corridor in a manner similar to the existing bridge. One of the replacement concepts is shown in Figure 3.3-3, with the span over the LOSSAN corridor shown in the right of the figure.

Figure 3.3-3 Proposed Sixth Street Bridge Replacement Concept 2

Source: City of Los Angeles Bureau of Engineering

3.3.4 BNSF Hobart Yard Expansion and Access Grade Separation

Same as Section 3.3.4 in 2009 Draft AA Report

3.3.5 I-710 Corridor Project

Section not included in 2009 Draft AA Report and added as follows:

The I-710 Corridor Project is an 18-mile freeway project that would improve passenger and goods movement vehicles throughout the region between the Ports of Long Beach and Los Angeles in the south, to Los Angeles and the Pomona Freeway (SR-60) to the north. In 2005 Metro released the I-710 Major Corridor Study that established a Locally Preferred Strategy. The Locally Preferred Strategy calls for the addition of general purpose lanes for a total of 10 lanes, the creation of a 4-lane truckway, which would be dedicated to goods movement throughout the length of the corridor, and improvement of several interchanges in the corridor. Additionally, a dedicated ingress/egress freeway truck ramps are proposed at Sheila Street, near the HST crossing of the I-710, to allow trucks to access Washington Boulevard and the UP and BNSF rail yards.

The project is currently undergoing environmental reviews, with a Draft EIR/EIS expected to be completed in Fall 2010 and an approved Final EIR/EIS in Fall 2011. The Study Area and route of the I-710 Corridor Project is shown in Figure 3.3-4.

Figure 3.3-4 I-710 Corridor Project – Study Area and Route

Source: Metro

3.3.6 BNSF Third Main Track and Grade Separation Project

Same as Section 3.3.3 in 2009 Draft AA Report

3.3.7 OCTA Metrolink Service Expansion Program

Same as Section 3.3.2 in 2009 Draft AA Report

3.3.8 Anaheim Regional Transportation Intermodal Center (ARTIC)

Same as Section 3.3.1 in 2009 Draft AA Report

3.3.9 Projects to be Constructed / Operated by Others

Same as Section 3.3.6 in 2009 Draft AA Report with addition of following subsection:

A. Fullerton Transportation Center (FTC) Improvements

The Fullerton Transportation Center (FTC) is the busiest train station in Orange County, providing access to both Amtrak and Metrolink rail service, the OCTA bus system, private taxi service and bicycle storage. On April 27, 2009, the OCTA approved Fullerton's Project T grant funding application, allowing the city to perform preliminary engineering for the proposed expansion of the FTC. The proposed expansion will include an additional station platform and other improvements. A Draft EIR/EIS for FTC improvements is currently underway and is expected to be released for public review in 2010.

3.3.10 No Project Alternative Configuration by Subsection

Section 3.3.7 in 2009 Draft AA Report replaced as follows:

The configuration of the No Project Alternative through the various jurisdictions along the LA-A HST section is described in the following sections.

A. LAUS to Hobart Yard

In the City of Los Angeles from LAUS south to Redondo Junction near Hobart Yard, the LOSSAN corridor follows the west bank of the Los Angeles River.

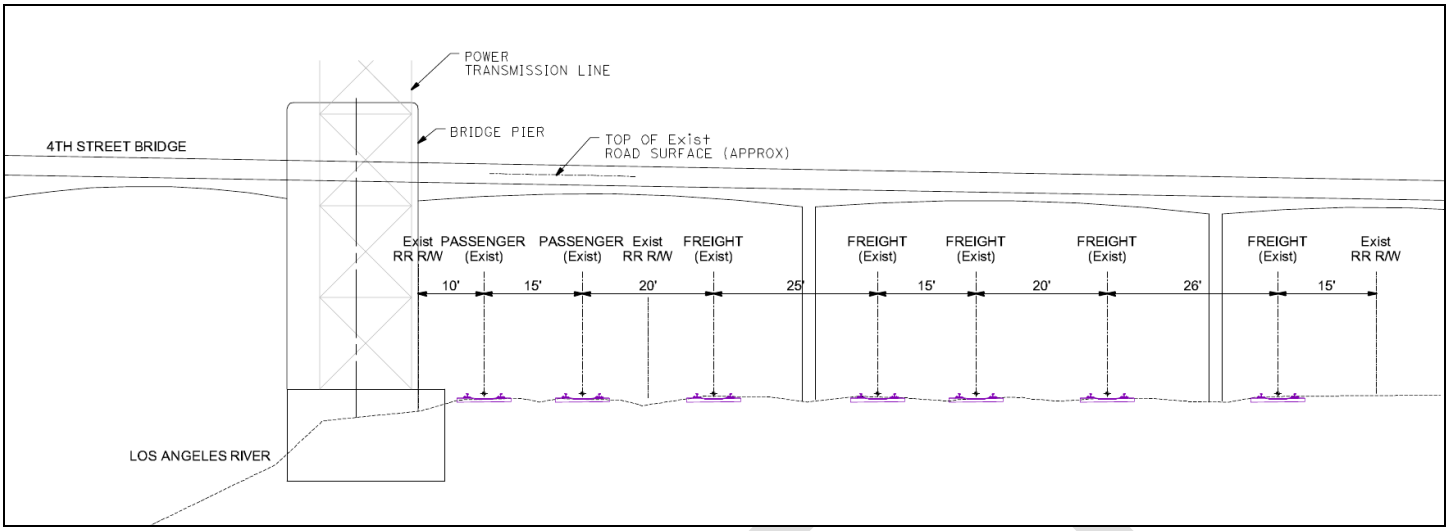
Planned improvements along this section of the corridor through the City of Los Angeles that are included in the No Project Alternative include:

- Metrolink Keller Street Yard (See Section 3.3.1)
- Widening of First Street Bridge (See Section 3.3.2)
- Seismic Retrofit of Sixth Street Viaduct (See Section 3.3.3)

In addition, the Los Angeles Union Station Run-Through Tracks Project is noted on engineering plans in the vicinity of LAUS, but is not included in the No Project Alternative (See Section 3.3.10).

A typical cross-section for the No Project Alternative along the Los Angeles River is shown in Figure 3.3-5.

Figure 3.3-5 No Project Alternative – Typical Cross-Section – LAUS to Hobart Yard



Source: STV Incorporated, 2010

B. Hobart Yard to Fullerton

The passenger-oriented Los Angeles County Metropolitan Transportation Authority (Metro) River Subdivision meets the freight-oriented BNSF San Bernardino Subdivision at Redondo Junction, just west of Hobart Yard. From Redondo Junction to Fullerton Junction (to the east of the FTC), large volumes of both freight and passenger trains share the LOSSAN corridor. The subsection of the LOSSAN corridor between Redondo Junction and Fullerton runs through a number of cities, including:

- Los Angeles
- Vernon
- Bell
- Commerce
- Montebello
- Pico Rivera
- South Whittier / Los Nietos (Unincorporated Los Angeles County)
- Santa Fe Springs
- Norwalk
- La Mirada
- Buena Park
- Fullerton

Planned improvements along this section of the corridor that are included in the No Project Alternative include:

- **BNSF Hobart Yard Expansion and Access Grade Separation** (See Section 3.3.4) (Vernon)
- **I-710 Corridor Project** (See Section 3.3.5) (Vernon / Commerce)
- **BNSF Third Main Track Project** (See Section 3.3.6) (Montebello-Buena Park), including Crossing Closure at Serapis Ave (Pico Rivera) and grade separations (underpasses) at:
  - Passons Boulevard (Pico Rivera)
  - Pioneer Boulevard (Santa Fe Springs / LA County)
  - Norwalk Boulevard (Santa Fe Springs)
  - Los Nietos Road (Santa Fe Springs)

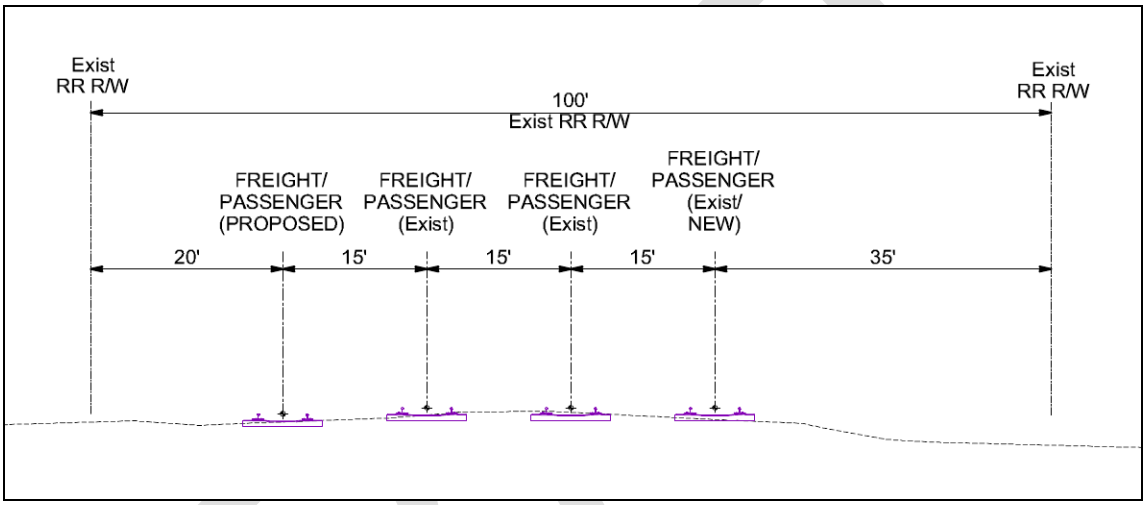
- Lakeland Road (Santa Fe Springs)
- Rosecrans Avenue / Marquardt Avenue (Santa Fe Springs)
- Valley View Avenue (La Mirada / Santa Fe Springs)

- **OCTA Metrolink Service Expansion Program** (See Section 3.3.7) (Fullerton), including:
  - Fullerton Turnback Facility

In addition, the LOSSAN Corridor Fourth Main Track and FTC Improvement Projects are noted on engineering plans in the corridor, but not included in the No Project Alternative (See Section 3.3.9).

Through these areas, the LOSSAN corridor will be upgraded to three mainline tracks with space for a future fourth track. A typical cross-section for the Hobart Yard to Fullerton subsection of the No Project Alternative is shown in Figure 3.3-6.

Figure 3.3-6 No Project Alternative – Typical Cross-Section – Hobart Yard to Fullerton



Source: STV Incorporated, 2010

C. Fullerton to Anaheim

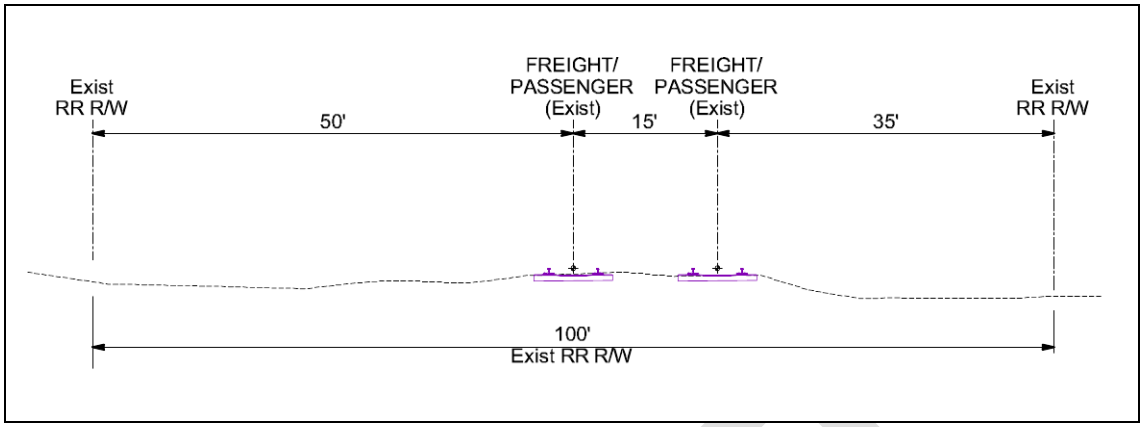
Due to lower volumes of freight traffic, there are only two mainline LOSSAN corridor tracks along the OCTA Orange Subdivision through Anaheim. The existing LOSSAN corridor ROW is 100’ (30.5 meters) wide in its northern and southern sections of the city, only 50’ (15.2 meters) wide between Vermont Avenue and North Street.

Planned improvements along this section of the corridor that are included in the No Project Alternative include:

- **OCTA Metrolink Service Expansion Program** (See Section 3.3.7), including:
  - Anaheim Layover Facility
  - CP Stadium Improvements
- **Anaheim Regional Transportation Intermodal Center** (See Section 3.3.8)

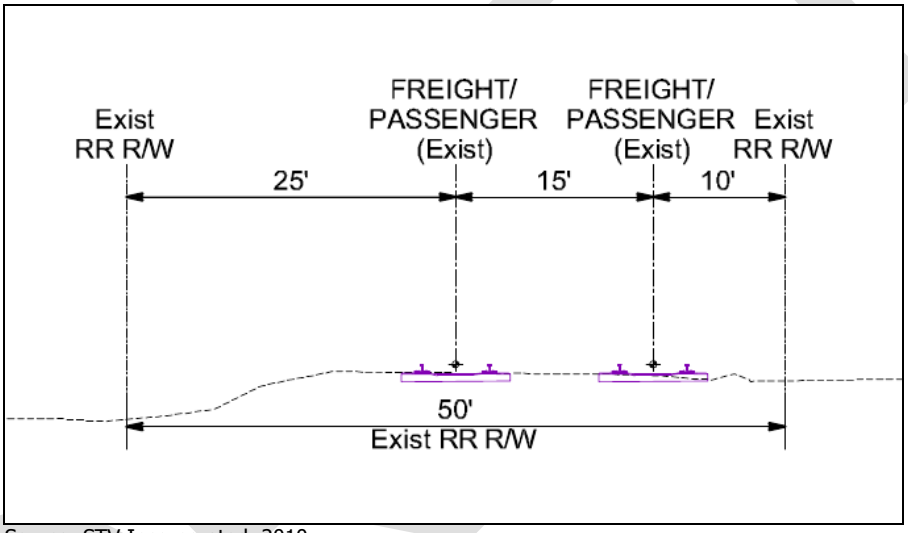
A typical cross-section for the 100’ (30.5 meters) ROW is shown in Figure 3.3-7, and a typical cross-section for the 50’ (15.2 meters) ROW is shown in Figure 3.3-8.

Figure 3.3-7 No Project Alternative – Typical Cross-Section – Fullerton to Anaheim – 100′ ROW



Source: STV Incorporated, 2010

Figure 3.3-8 No Project Alternative – Typical Cross-Section – Fullerton to Anaheim – 50′ ROW

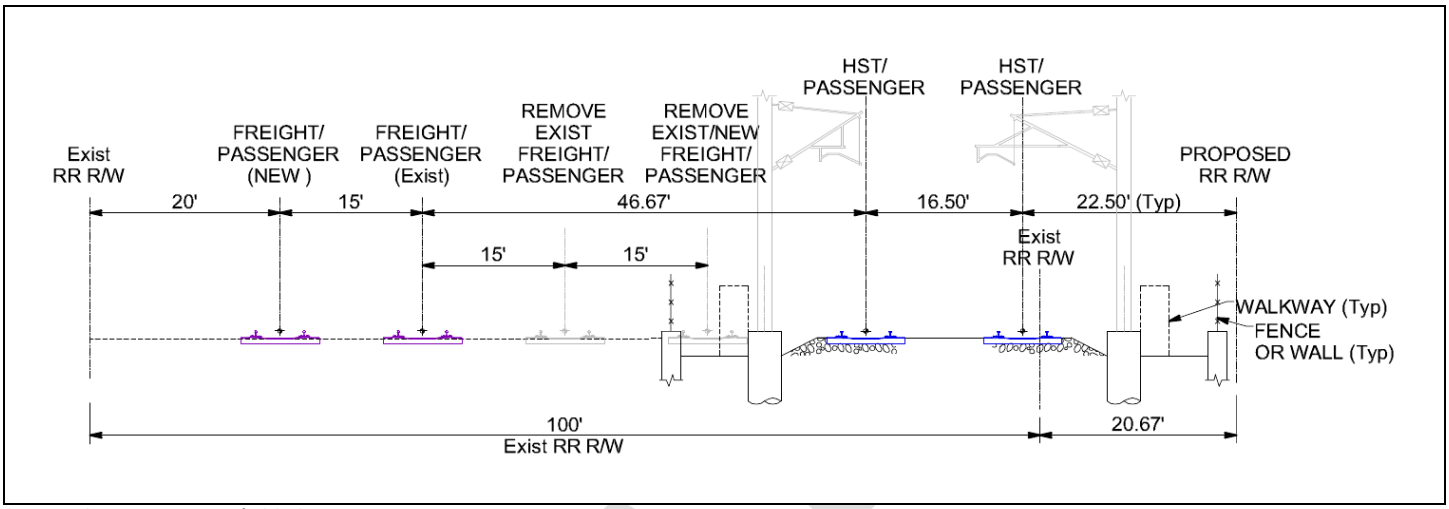


Source: STV Incorporated, 2010

3.4 PROGRAM-LEVEL SHARED-TRACK ALTERNATIVE

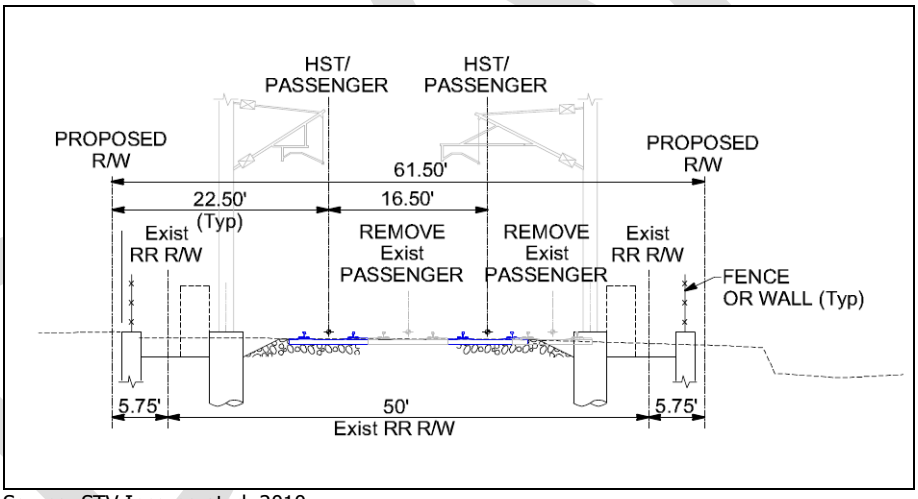
Same as Section 3.4 in 2009 Draft AA Report with replacement of typical cross-sections (Figures 3.19 and 3.21) as follows due to changes in HST Design Criteria

Figure 3.4-1 Program-Level Shared-Track Alternative – Typical Cross-Section – Hobart Yard to Fullerton



Source: STV Incorporated, 2010

Figure 3.4-2 Program-Level Shared-Track Alternative – Typical Cross-Section – Fullerton to Anaheim (50’ ROW)

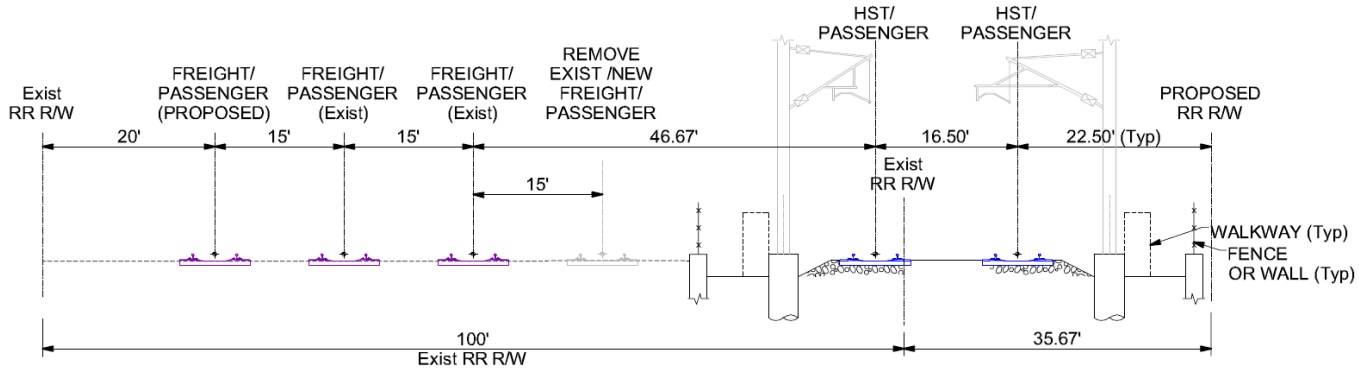


Source: STV Incorporated, 2010

3.5 EXPANDED SHARED-TRACK ALTERNATIVE (3+2)

Same as Section 3.5 in 2009 Draft AA Report with replacement of typical cross-section (Figure 3.25) as follows due to changes in HST Design Criteria

Figure 3.5-1 Expanded Shared-Track Alternative – Typical Cross-Section – Hobart Yard to Fullerton



Source: STV Incorporated, 2010

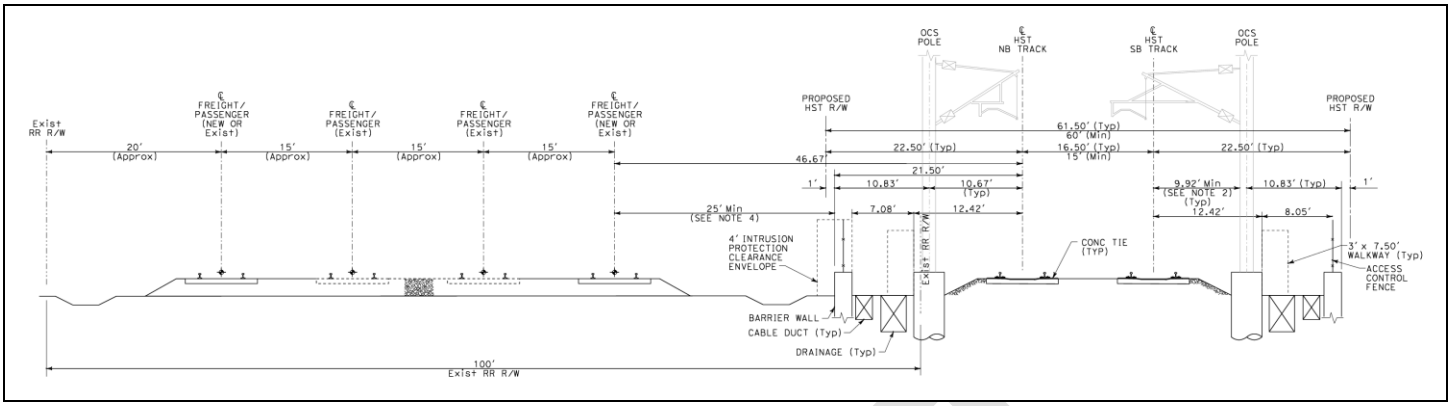
3.6 DEDICATED HIGH-SPEED TRAIN ALTERNATIVE (4+2)

Same as Section 3.6 in 2009 Draft AA Report with replacement of Section 3.6.2 as follows:

3.6.2 Typical Configuration – Hobart Yard to Fullerton

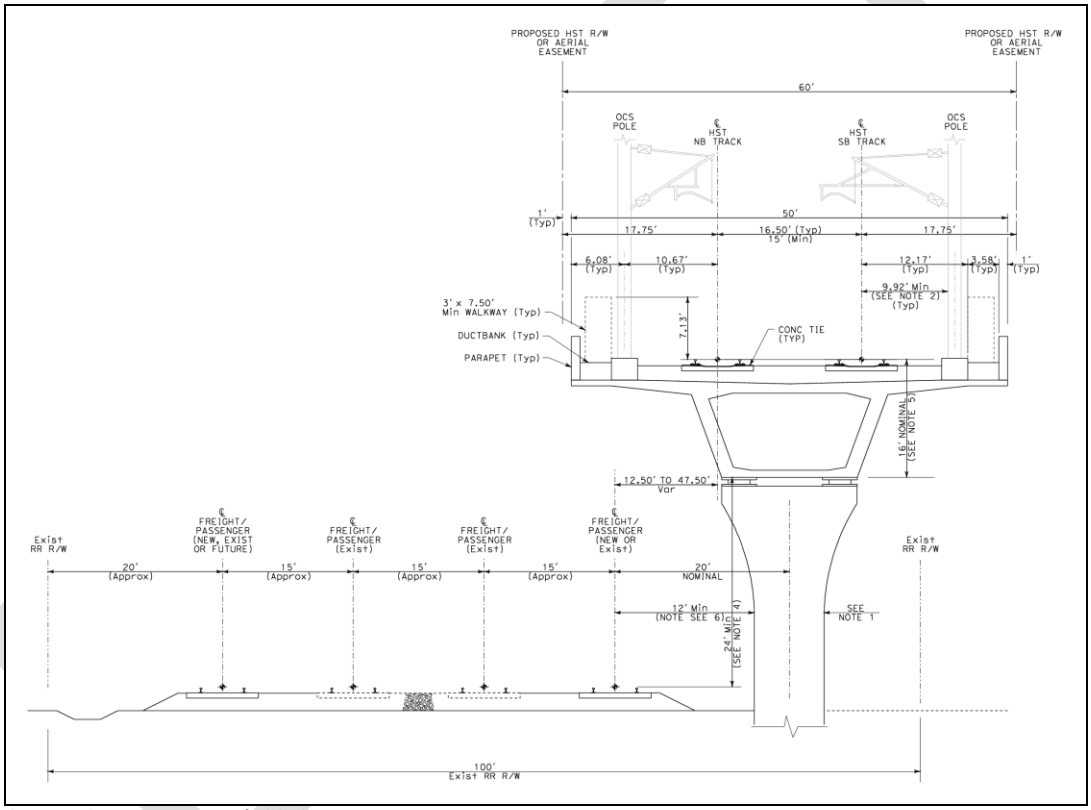
From Hobart Yard to Fullerton, space for six tracks would typically be needed for the Dedicated HST Alternative. Similar to the Expanded Shared-Track Alternative, two new tracks would be added to the south of the existing tracks (space is provided for a future fourth track to the north). This allows the reuse of the three existing tracks and many of the existing grade crossing structures. However, such a configuration would require additional ROW on the south side of the corridor as shown in Figure 3.6-1 and in Appendix E. It may be possible to acquire less ROW with minimum clearances and special accommodations for catenary poles and wayside signal equipment. In constrained areas, shifted at-grade or aerial alignment options are investigated to minimize property acquisition needs. A typical aerial cross-section is shown in Figure 3.6-2. Trench and tunnel options are generally not feasible in this section due to the extensive number of existing undercrossings in the corridor and the required depth of tunnel, except for short tunnels or trenches required by special geographic or ROW constraints. The typical cross-section differs from that shown in the Draft AA Report based on revisions to the HST project's design criteria.

Figure 3.6-1 Dedicated HST Alternative – Typical Cross-Section – Hobart Yard to Fullerton – At-Grade



Source: STV Incorporated, 2010

Figure 3.6-2 Dedicated HST Alternative – Typical Cross-Section – Hobart Yard to Fullerton – Aerial



Source: STV Incorporated, 2010

3.7 CONSOLIDATED SHARED-TRACK ALTERNATIVE (3+2)

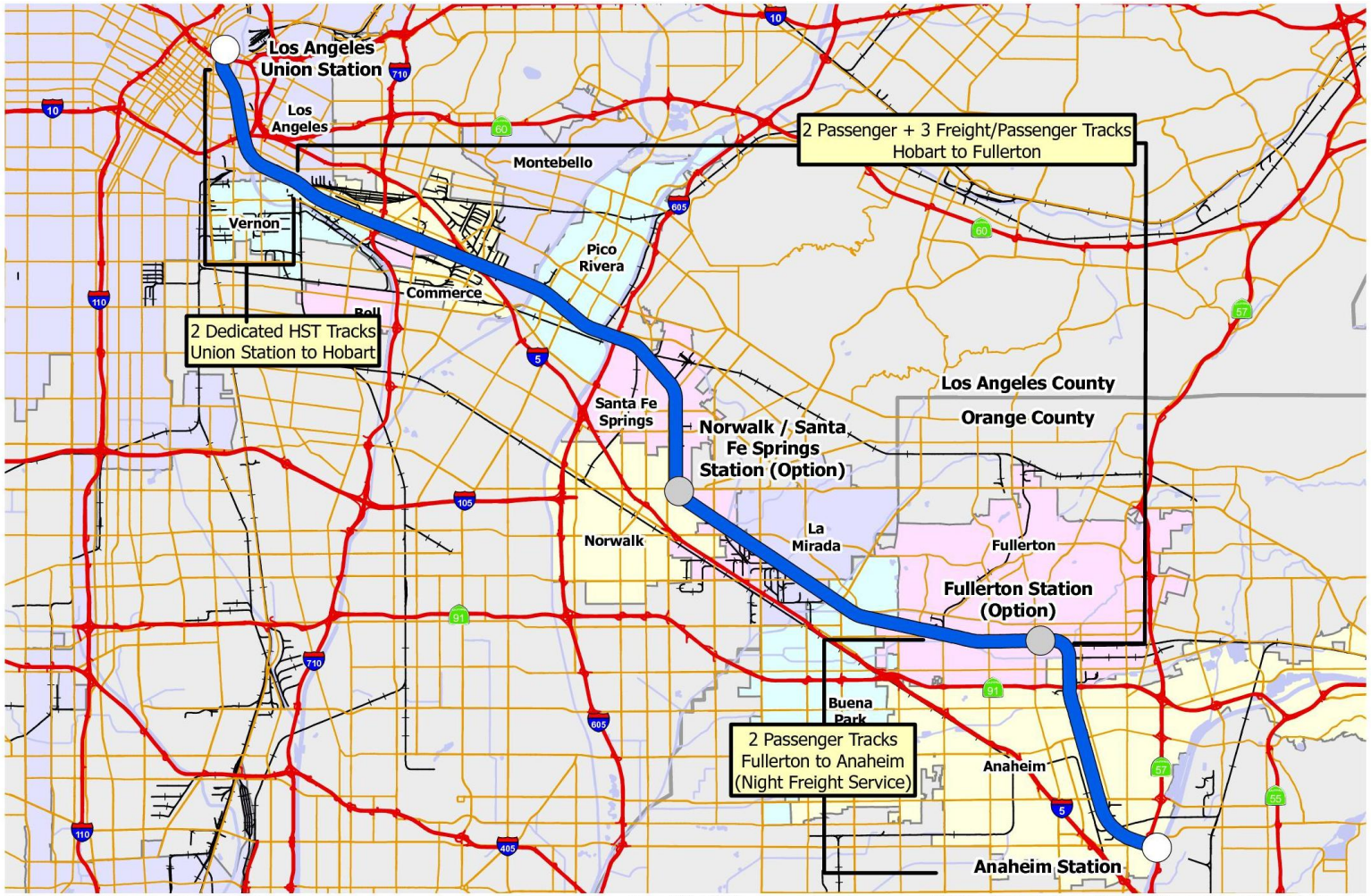
Section not included in 2009 Draft AA Report and added as follows:

The Draft AA Report completed in April 2009 recommended that the Program-Level and Expanded Shared Track Alternatives not be carried forward for further analysis, and that the Dedicated HST Alternative be carried forward as the sole Build Alternative (See Section 3.9 for further details). The Authority continued coordination with project stakeholders such as Metro, OCTA, Metrolink and Amtrak throughout 2009 and 2010, seeking to further develop the Dedicated HST Alternative. Through the course of this work, the Authority and project stakeholders proposed new operational and physical configurations that allow for consideration of a revised Shared-Track Alternative in the corridor. Many of these issues were described in a joint letter from the CEOs of Metro and OCTA to the Authority on March 23, 2010, which is included in Appendix H. The Authority Board approved the examination of the Consolidated Shared-Track Alternative in April 2010.

The main design objective of the Consolidated Shared-Track Alternative is to accommodate all LOSSAN corridor operators on a footprint smaller than the Dedicated HST Alternative and in a way that maximizes the utility of the tracks for all corridor operators. The Consolidated Shared-Track Alternative builds off the designs of the three prior Build Alternatives that had been designed between 2007 and 2010. An overview of the alternative is shown in Figure 3.7-1.

Alignment Drawings for the new Consolidated Shared-Track Alternative can be found in Appendix I. Given the early stage of design for the alternative and the need for additional coordination with key stakeholders, the initial design presented in this report is expected to undergo further development and revision.

Figure 3.7-1 Consolidated Shared-Track Alternative – Overview



Source: STV Incorporated, AE LLC

June 28, 2010

California High-Speed Train Alternatives Analysis Report

0 1 2 4 6 Miles

0 1 2 4 6 Kilometers

Legend

Station
Optional Station
CA Counties
Corridor
Freeway
Railroads
Arterials

Consolidated Shared-Track Alternative - Overview

3.7.1 Typical Configuration – LAUS to Hobart Yard

The typical configuration for the Expanded Shared-Track Alternative from LAUS to Hobart Yard is described in Sections 5.1 to 5.3.

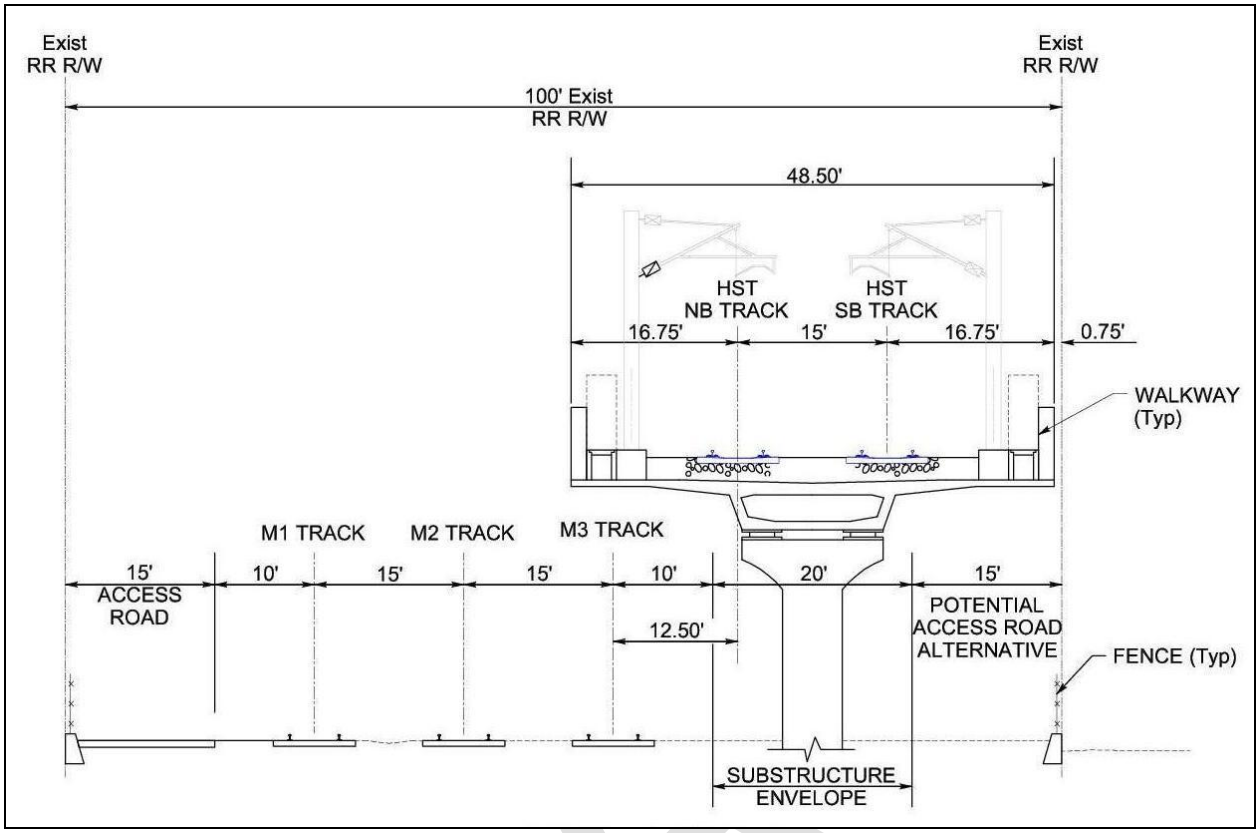
3.7.2 Typical Configuration – Hobart Yard to Fullerton

From Hobart Yard to Fullerton, five tracks would be needed for the Consolidated Shared-Track Alternative. Several options were examined for fitting these tracks into as small a footprint as possible to minimize acquisitions and impacts to adjacent properties. Typical cross-sections that were investigated include at-grade, raised on a box culvert, and several aerial configurations. An aerial cross-section was chosen as the preferred typical configuration over the other options in this section for the reasons outlined below:

- **At-Grade** – Design would require approximately 40 feet (12.2 meters) of additional ROW to allow for safe separation of passenger and freight trains, and would require the complete rebuilding of most LOSSAN corridor tracks and bridges, and cut off access to BNSF freight service on one side of corridor.
- **Raised** – This design, which would utilize a concrete box culvert or retained fill configuration raised above the existing tracks, would require complete rebuilding of most LOSSAN corridor tracks and bridges and cut off access to BNSF freight service on one side of corridor. Raised profile would likely mitigate many safety concerns of at-grade configuration and lesson ROW acquisition needs.
- **Aerial** – Design would allow for reuse of most tracks and bridges in the corridor, and would generally require only minimal ROW acquisitions. Raised profile would provide for separation between freight and passenger trains.

Generally, the alternative described in this report includes an aerial structure on the south side of the LOSSAN corridor ROW as shown in Figure 3.7-2 between Hobart Yard and Norwalk, and an at-grade cross-section similar to the Dedicated HST Alternative from Norwalk to Fullerton where the existing railroad corridor is wider. In the Montebello area, an at-grade or aerial configuration is being considered.

Figure 3.7-2 Consolidated Shared-Track Alternative – Typical Cross-Section – Hobart Yard to Fullerton



Source: STV Incorporated, 2010

3.7.3 Typical Configuration – Fullerton to Anaheim

The typical configuration for the Consolidated Shared-Track Alternative through Anaheim is identical to that of the Program-Level Shared-Track Alternative, and is described in Section 3.4.

3.7.4 Typical Configuration – Stations

Stations for the Consolidated Shared-Track Alternative would be built to support two or four tracks and either straddle the at-grade freight tracks below (similar to the aerial station designs for the Program-Level Shared Track Alternative or parallel the existing tracks at-grade. Station designs for Consolidated Shared-Track Alternative stations are shown in Sections 5.4 and 5.9.

3.8 OPERATIONAL FEASIBILITY STUDY

Same as Section 3.7 in 2009 Draft AA Report with exception of subsections added / replaced as noted below:

3.8.1 No Project Alternative

Same as Section 3.7.1 in 2009 Draft AA Report

3.8.2 Program-Level Shared-Track Alternative

Same as Section 3.7.2 in 2009 Draft AA Report

3.8.3 Expanded Shared-Track Alternative

Same as Section 3.7.3 in 2009 Draft AA Report

3.8.4 Dedicated HST Alternative

Same as Section 3.7.4 in 2009 Draft AA Report

3.8.5 Consolidated Shared-Track Alternative

Section not included in 2009 Draft AA Report and added as follows:

A key feature of the Consolidated Shared-Track Alternative is that it will coordinate operations of other passenger operations in the corridor. The alternative assumes it is possible to coordinate operation and develop the additional capacity to support the combined operations of HST, Metrolink and Amtrak trains in the corridor that sustains the current and projected service levels in the corridor without degradation of service. These consolidated operations allow for up to 3 HSTs, 2 Metrolink trains, and 1 Amtrak train to operate per hour in each direction between Los Angeles and Anaheim.

Preliminary operations analyses have been carried out to determine the general configuration of the Consolidated Shared-Track Alternative. Operating parameters will be defined further as the project progresses.

3.8.6 Summary

Section 3.7.5 in 2009 Draft AA Report replaced as follows:

The Dedicated HST Alternative and Consolidated Shared-Track Alternative were identified as the only alternatives capable of accommodating the peak demand forecast for all classes of train service at acceptable levels of reliability and on-time performance. The Program-Level Shared Track and Expanded Shared-Track Alternatives were not carried forward for further consideration after it was determined that the shared use configuration assumed in these scenarios did not adequately meet the need for HST service and could not support the assumed future volume of freight or passenger trains (including HST) at an acceptable level of performance.

The Dedicated HST Alternative to be carried forward consists of two main HST tracks. This scenario was modeled with four conventional tracks to confirm future capacity between Redondo and Fullerton Junctions, and was able to accommodate the forecast train volumes in the corridor at an acceptable performance level. Given that the fourth conventional track and 30 Minute Metrolink service to Los Angeles are not currently funded and are not included in the No Project Alternative, the Dedicated HST

Alternative assumes maintenance of three main conventional tracks between Redondo and Fullerton Junctions. Space will also be identified that can be preserved for a fourth main track, which could be added by others in the future as conventional train volumes require.

3.9 PROJECT ALTERNATIVES ELIMINATED / CARRIED FORWARD

Section 3.8 in 2009 Draft AA Report replaced as follows:

The Dedicated HST and the Consolidated Shared-Track Alternatives are the two alternatives that would best provide the capacity and performance of operations to introduce HST service between Los Angeles and Anaheim. The Dedicated HST Alternative's two tracks that are exclusively for high-speed trains allow for higher-speed HST operations than the shared-track alternatives, and remove potential impacts from delayed Metrolink and Amtrak service. In addition, it provides for a safer environment (no mixing of conventional trains including locomotives with lightweight electric multiple-unit HSTs) that does not present as many safety issues that would require a waiver from the FRA. The Consolidated Shared-Track Alternative mitigates the operating impacts of shared-track operation (such as congestion and delay) by consolidating all passenger rail schedules in the corridor, and provides safe separation between freight trains and HSTs with a mainly aerial configuration between Los Angeles and Norwalk / Santa Fe Springs.

The largest impacts from the Dedicated HST alternative come from the need to acquire ROW through typical at-grade sections where the track has not been shifted (15 feet / 4.6 meters more than the Expanded Shared-Track Alternative). This additional ROW generally includes industrial uses, but also includes some residential areas in the southern sections of the project. Fewer stations are required for this alternative and those remaining would be potentially simpler than the Shared-Track Alternative stations, as they would not need to serve different train types (e.g. local versus express, low platforms versus high platforms) at each station. Instead, a dedicated HST station would be a stand-alone operation constructed next to or over the existing Metrolink and Amtrak stations.

The Consolidated Shared-Track Alternative reduces the need for extensive ROW acquisitions with a mainly aerial configuration between Los Angeles and Norwalk / Santa Fe Springs. However, it will require more complicated stations than the Dedicated HST Alternative due to its mix of vehicle types.

Based on the results of the operations modeling and safety considerations, only the Dedicated HST and Consolidated Shared-Track Alternatives meet the project purpose and objectives. Both the Program-Level Shared Track and Expanded Shared Track Alternatives are infeasible due to their inability to provide for safe, frequent and reliable HST service and inability to accommodate all rail operators in the corridor at acceptable operating levels of service. Due to these and other issues, the Program Level Shared Track and Expanded Shared Track Alternatives do not meet the project purpose and objectives and are recommended for elimination from further consideration. The Dedicated HST Alternative (previously defined in the 2009 Draft AA Report) and the newly defined Consolidated Shared-Track Alternative are recommended to be carried forward into preliminary design and environmental review in the Draft EIR/EIS.

4.0 Definition / Evaluation of Subsection Options – Dedicated HST Alternative

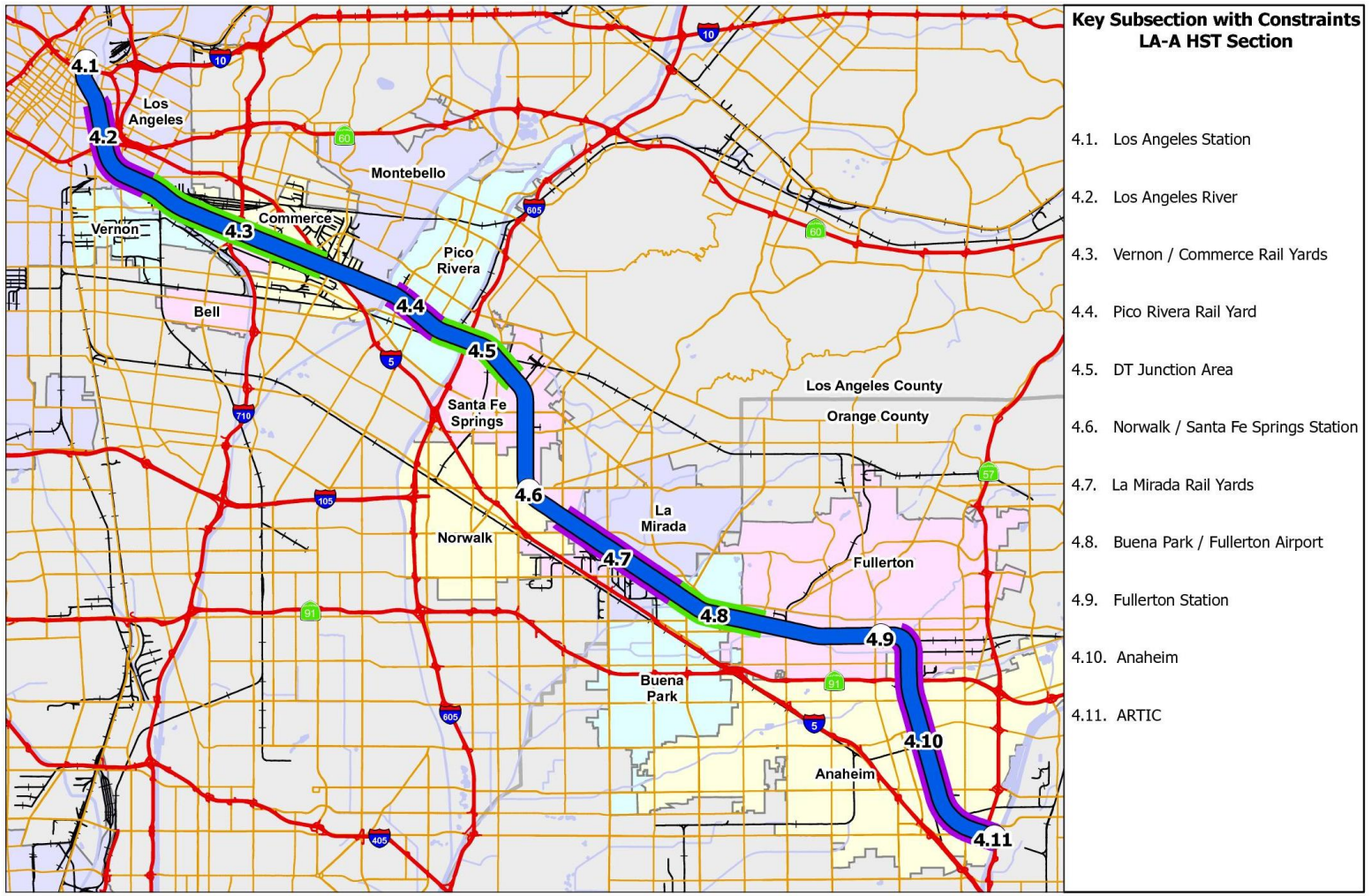
Section 4.0 in 2009 Draft AA Report with introductory text modified as follows and subsections modified as noted:

This section focuses on further defining individual subsections of the Dedicated HST Alternative. These key subsections have non-typical configurations or several design options to address key constraints. They are shown in Figure 3.9-1 and described and evaluated in the following sections. All other subsections of the Dedicated HST Alternative between Los Angeles and Anaheim utilize the typical at-grade configuration as shown in Figure 3.6-1.

Report Section	LA-A Subsection with Design Options
4.1	Los Angeles Station
4.2	Los Angeles River
4.3	Vernon / Commerce Rail Yards
4.4	Pico Rivera Rail Yard
4.5	DT Junction
4.6	Norwalk / Santa Fe Springs Station
4.7	La Mirada Rail Yards
4.8	Buena Park / Fullerton Airport
4.9	Fullerton Station
4.10	Anaheim
4.11	ARTIC

Options at key subsections of the Consolidated Shared-Track Alternative are defined and evaluated in Section 5.0.

Figure 3.9-1 Los Angeles to Anaheim – Dedicated HST Alternative – Key Subsections with Constraints



4.1 LOS ANGELES STATION

Same as Section 4.13 in 2009 Draft AA Report with additional design options analyzed as noted

Five options are examined for the Los Angeles Station: aerial, at-grade, and deep tunnel options at the existing LAUS, an aerial station at Vignes Street and a below-grade station along the west bank of the Los Angeles River. These options are shown in Figure 4.1-3 and evaluated in Table 4.1-1. A complete list of all the alignment and station locations considered for LAUS is included in Appendix J.

4.1.1 LAUS Aerial HST Station Option

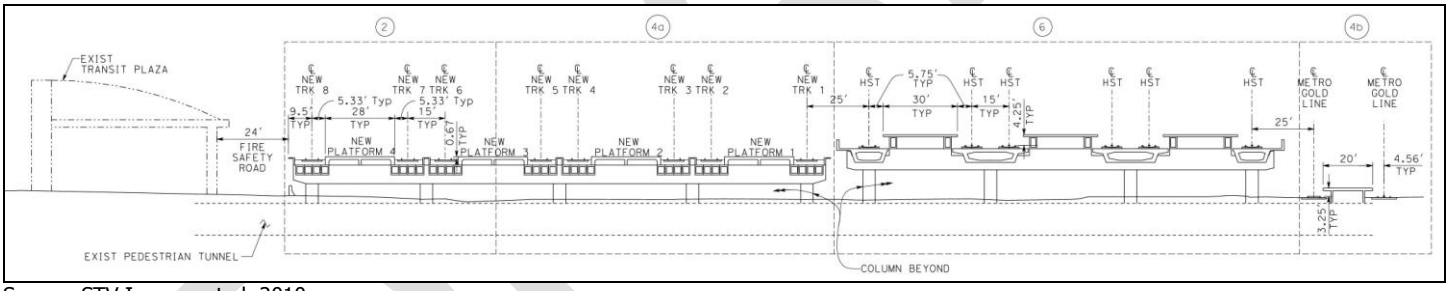
Same as Section 4.13.1 in 2009 Draft AA Report

4.1.2 LAUS At-Grade HST Station Option

Section not included in the 2009 Draft AA Report and added as follows:

The at-grade station option locates the HST station directly parallel to the existing LAUS. The HST station includes six tracks and three platforms and connects to the other amenities at LAUS. A typical cross-section for the station is shown in Figure 4.1-1. A sharper curve has been designed to the south of the station for the Draft Final AA to minimize impacts to the Arts District, with the tracks closely following the route of the proposed LAUS Run-Through Tracks Project as described in Section 3.3.9. This option would also require significant reconstruction of the existing Metrolink, Amtrak, and Metro Gold Line tracks and platforms.

Figure 4.1-1 Typical Cross-Section – Los Angeles Station – LAUS At-Grade HST Station Option



Source: STV Incorporated, 2010

4.1.3 LAUS Deep Tunnel HST Station Option

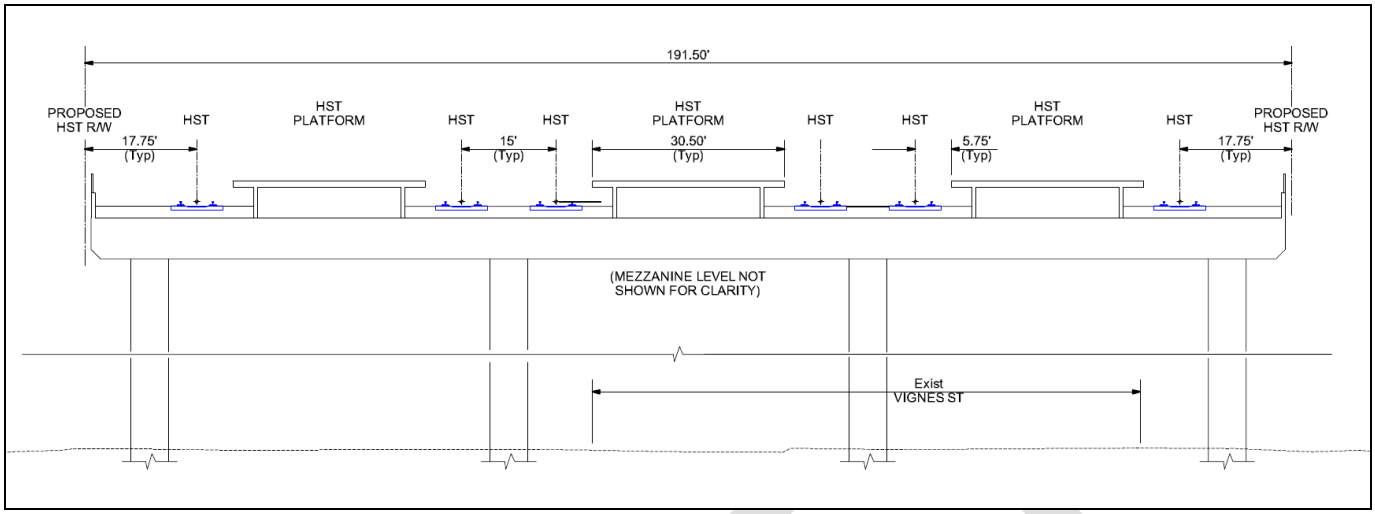
Same as Section 4.13.2 in 2009 Draft AA Report

4.1.4 Vignes Aerial HST Station Option

Section not included in 2009 Draft AA Report and added as follows:

An alternate aerial station option locates the HST station above Vignes Street to the east of the existing LAUS. This station option would likely require partial acquisition of the Metro headquarters building, the City of Los Angeles' C. Erwin Piper Technology Center (Piper Tech), and the Los Angeles County Jail. A typical cross-section of the station is shown in Figure 4.1-2. This option was developed after further consultation with stakeholders in the area. A family of four designs has been examined for the Vignes Aerial HST Option, but all have similar configurations and footprints over Vignes Street.

Figure 4.1-2 Typical Cross-Section – Los Angeles Station – Vignes Aerial HST Station Option



Source: STV Incorporated, 2010

4.1.5 West Bank Trench HST Station Option

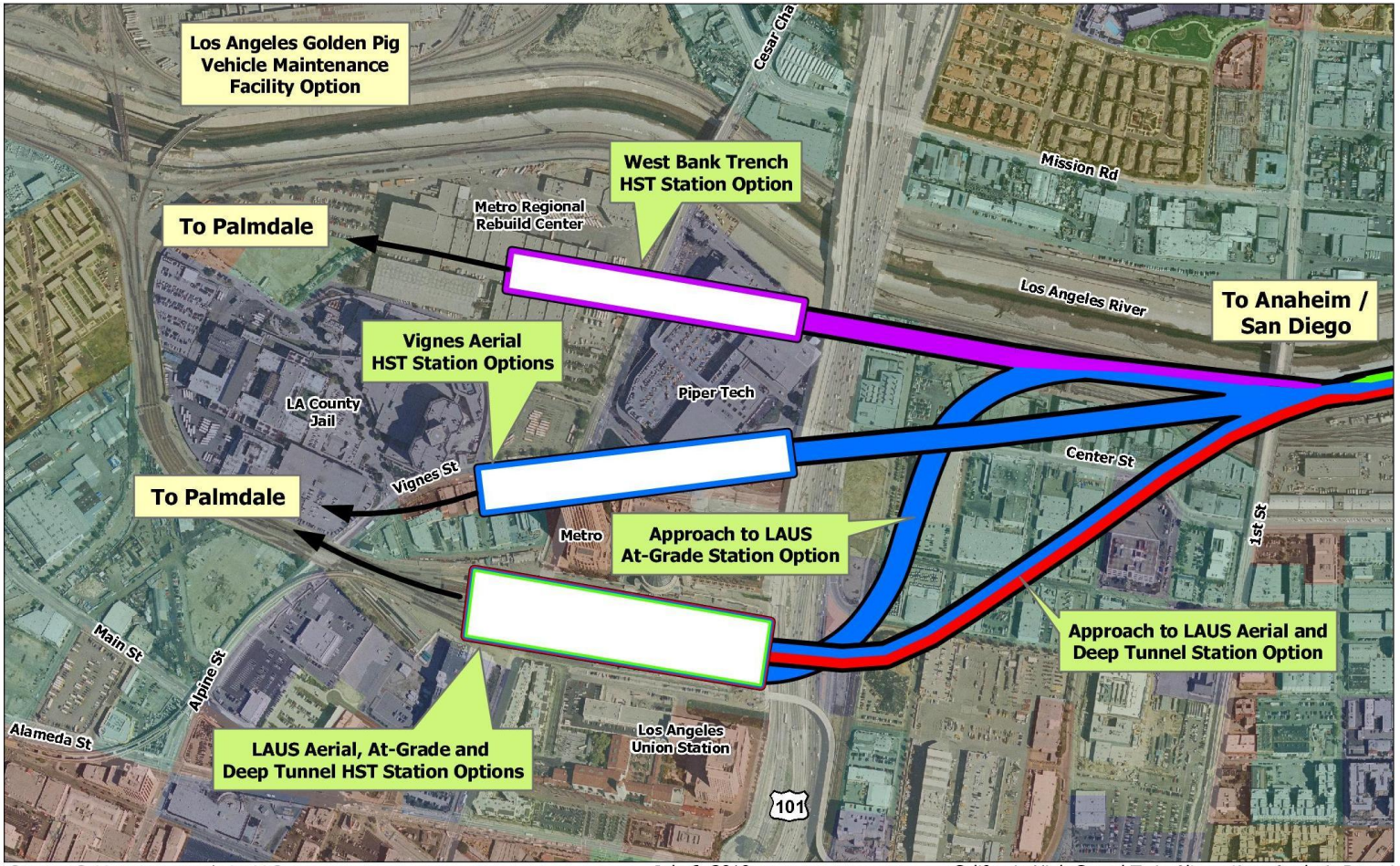
Same as Section 4.13.3 in 2009 Draft AA Report

4.1.6 Overview Figure and Evaluation Table

Figure 4.32 in 2009 Draft AA Report replaced with Figure 4.1-3

Evaluation Table 4.13.4 in 2009 Draft AA Report replaced with Table 4.1-1

Figure 4.1-3 Los Angeles Station – Overview



Source: STV Incorporated, AE LLC

July 6, 2010

California High-Speed Train Alternatives Analysis Report

0 0.05 0.1 0.2 Miles

0 0.1 0.2 Kilometers

Legend

Vertical Profile

- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses

- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

Los Angeles Station
Dedicated HST Alternative - Overview

Table 4.1-1 Evaluation Table – Los Angeles Station Options

Evaluation Measure	LAUS Aerial HST Station Option	LAUS At-Grade HST Station Option	LAUS Deep Tunnel HST Station Option	Vignes Aerial HST Station Option	West Bank Trench HST Station Option
Design Objectives					
Ridership / Revenue Potential	All options have similar ridership potential.				
Intermodal Connections	Amtrak / Metrolink / Metro Gold Line tracks are one level directly below HST platforms (at-grade). Metro Red / Purple Line will be two-levels down (below-grade). Issues are mainly related to vertical circulation (escalators, elevators, etc).	HST / Amtrak / Metrolink / Metro Gold Line tracks will all be located at the same level (at-grade). Metro Red / Purple Line will be one-level down (below-grade). Issues are mainly related to vertical circulation (escalators, elevators, etc).	Metro Red Line will be one level above; Amtrak / Metrolink / Metro Gold Line will be two levels above. Circulation issues will mainly be vertical (escalators, elevators, etc).	LAUS connections to other lines are approximately 200 feet from HSR station. Vertical circulation elements may traverse part of this distance.	LAUS connections to other lines are approximately 1,200 – 1,700 feet (518 meters) from HST station. Vertical circulation elements may traverse part of this distance. Moving walkways / people mover may be needed.
Capital Costs	Expensive aerial station structure, with structure and relocation costs for approaches.	At-grade station construction is less expensive than aerial or below-grade stations, but requirement to rebuild all existing tracks at LAUS will raise capital cost.	Very expensive deep tunnel station and approaches, with few relocation costs.	Expensive aerial station structure which requires relocation of several institutional structures, with structure and relocation costs for approaches.	Expensive trench station structure which requires relocation of several institutional structures.
Operating Costs	Operating costs comparable to At-Grade, West Bank and Vignes options, less than Deep Tunnel option.	Operating costs comparable to Aerial, West Bank and Vignes options, less than Deep Tunnel option.	Highest operating costs to run tunnel equipment.	Operating costs comparable to LAUS Aerial and At-Grade options and West Bank option, less than Deep Tunnel option.	Operating costs comparable to LAUS Aerial and At-Grade options and Vignes aerial option, less than Deep Tunnel option.
Operations Issues	Sharp curves south of station to avoid impacts to Arts District limit HST speeds until Los Angeles River is reached.		No HST operations issues foreseen, as curves into station are gradual.		
Land Use					
Station Area Development Potential	Existing Union Station and Alameda District Plans identify joint development opportunities around LAUS property which will be enhanced by HST station.			ROW acquisitions may create coordinated development opportunities, including large parcel that the Piper Tech building currently occupies.	
Consistency with Other Planning Efforts	Development above LAUS included in Alameda District Plan. HST station at Union Station envisioned in regional transit planning activities. Northern approaches may affect planned greening of Los Angeles River.	HST station at Union Station envisioned in regional transit planning activities.		New structures above Vignes Street have not previously been envisioned in LAUS area planning activities. Northern approaches may affect planned greening of Los Angeles River.	HST station is adjacent to river, and may affect planned greening of Los Angeles River.

Evaluation Measure	LAUS Aerial HST Station Option	LAUS At-Grade HST Station Option	LAUS Deep Tunnel HST Station Option	Vignes Aerial HST Station Option	West Bank Trench HST Station Option
Constructability					
Construction Access Issues	A HST station could be built above active station tracks, where knockouts above ground level could accommodate tracks and platforms; Approach options will need significant demolition of existing structures and cross many streets; transport of materials, hazardous materials.	Option will require complicated construction staging to demolish and rebuild existing tracks and platforms while still operating rail service at station. Approach options will need significant demolition of existing structures and cross many streets; transport of materials, hazardous materials.	A large mining shaft would have to be located close to LAUS in order to remove subterranean material and soil and reach a depth (100 feet / 30.5 meters) to construct a HST station, pedestrian tunnel and vertical circulation facilities. In addition, the mine shaft would have to be dropped in close proximity to a location with sufficient space to stockpile soil and materials excavated during intensive mining and construction operations. Given the dense built environment around LAUS, there is no obvious place where mining operations of this scale will not result in local impacts to traffic circulation and access to Metro property bounded by Cesar Chavez, Alameda, Vignes and the 101 freeway. Additionally, the horizontal width required for a dome to accommodate new platforms, portals, 6 tracks, 3 platforms, underground station, vertical access to feed down to the new platforms, new utilities, and connection to existing passage way leading to LAUS is extensive. It may not be feasible to construct a substructure (including all foundation structures as drilled shaft, excavation, backfilling, support of excavation, footing, columns) that adequately supports the underground Metro Red Line station above the platforms.	Approach options will require significant demolition of existing structures and cross many streets; transport of materials, hazardous materials; Will require multiple property acquisitions to the north between Vignes Street and the HST tracks and partial acquisitions of properties that may include eastern wing of Metro Headquarters building, western wing of Piper Tech, and western portion of Los Angeles County Jail. May also require the relocation of the Union Bus Division at Cesar Chavez Avenue and Vignes Street (currently under construction).	Will require railroad coordination and property acquisitions at Piper Tech and RRC sites, but otherwise isolated from surrounding communities; constructability of a trenched HST station is not considered a significant project challenge. May also require the relocation of the Union Bus Division at Cesar Chavez Avenue and Vignes Street (currently under construction). Access from Ramirez and Vignes Streets.

Evaluation Measure	LAUS Aerial HST Station Option	LAUS At-Grade HST Station Option	LAUS Deep Tunnel HST Station Option	Vignes Aerial HST Station Option	West Bank Trench HST Station Option
Railroad Impacts	Construction above active railroad tracks will require significant coordination with Metrolink / Amtrak during construction period.	Construction on active railroad tracks and platforms will require significant coordination with Metrolink / Amtrak during construction period.	Options are not adjacent to existing railroad corridors, and can be constructed with minimal effect on existing rail operations in area.		Will require construction beside / below existing Metrolink / Amtrak tracks along LA River.
Utility Impacts	Several utility crossings in area. No expected difference between options.				
Neighborhood / ROW Impacts					
Displacements	Construction and operation of a HST Station can be accommodated on existing LAUS property. The approaches will need significant ROW to allow for the construction of the HST tracks, with extensive displacement of existing uses and the potential for access issues at other existing properties. The HST aerial approach would cross diagonally from LAUS to the Los Angeles River, and would result in the need to acquire approximately five industrial / commercial buildings and other vacant properties.		A below-grade HST Station can be constructed under the existing station with minimal additional ROW needed for both the station and the approaches. Underground ROW easements would be required for the approaches. Property acquisitions would be required for the portal and the staging area.	Would need to acquire multiple properties to the north between Vignes Street and the HST tracks and partially acquire properties that may include eastern wing of Metro Headquarters building, western wing of Piper Tech, and western portion of Los Angeles County Jail. May also require the relocation of the Union Bus Division at Cesar Chavez Avenue and Vignes Street (currently under construction).	Would need to acquire the Piper Tech building and the relocate Metro's RRC. Metro is also constructing Union Bus Division at the south end of the RRC property just north of Cesar Chavez Avenue. The alignment north of this station option also may result in of the need to acquire part of the Los Angeles County Detention Center.
Property Access Issues	Option may require some property access changes to south of LAUS because of aerial structure, columns, etc.		No major property access changes expected.	Option may require some property access changes to south of LAUS because of aerial structure, columns, etc.	No major property access changes expected.
Station Area Traffic Effects	All HST Station Options would introduce large numbers of new vehicle trips to the LAUS area.				
Grade Crossing Traffic Effects	Approaches will be elevated above all roadways in area. Option may require some temporary traffic modifications to roadways during construction.		Approaches will be depressed below all roadways in the area and will likely not have impacts to roadways.	Approaches will be elevated above all roadways in area. Option may require some temporary traffic modifications to roadways during construction.	Approaches will be depressed below all roadways in the area and will likely not have impacts to roadways.
Resource Impacts					
Waterways / Sensitive Habitat Areas	The HST Station and approaches would be elevated above the LA River floodplain. There are no sensitive habitat areas within the LAUS area.		The HST Station and approaches would be located below flood level of LA River, flooding risks would be avoided by flood-proofing techniques designed to protect ventilation and portal structures. There are no sensitive habitat areas within the LAUS area.	The HST Station and approaches would be elevated above the LA River floodplain. There are no sensitive habitat areas within the LAUS area.	The HST Station and approaches are located adjacent to LA River and possibly below the existing river bottom, which would require additional flood-proofing during construction and operation phases. There are no sensitive habitat areas within the LAUS area.

Evaluation Measure	LAUS Aerial HST Station Option	LAUS At-Grade HST Station Option	LAUS Deep Tunnel HST Station Option	Vignes Aerial HST Station Option	West Bank Trench HST Station Option
Cultural Resources	Los Angeles Union Station, Pueblo de Los Angeles, and Los Angeles River Bridges are all historic structures that may be affected by HST Station Options. Specific impacts discussed further below.		An underground HST Station and approaches would have a potential to affect buried archaeological resources in a culturally sensitive area. No major effects expected at surface.	Los Angeles Union Station, Pueblo de Los Angeles, and Los Angeles River Bridges are all historic structures that may be affected by HST Station Options. Specific impacts discussed further below.	
Parklands	Pueblo de Los Angeles State Park located to west of LAUS. Several parks planned along Los Angeles River. HST station options may affect LAUS-area parklands.				
Agricultural Lands	There are no agricultural lands within this area that would be affected.				
Environmental Impacts					
Noise / Vibration	The HST aerial structure would pass through an industrial / commercial area immediately south of LAUS. Uses that abut on the ROW would be exposed to noise and vibration effects during construction and operation.		During construction there would noise and vibration effects in the area of the portal and the staging area. Once the HST tracks are underground and at the underground station there would be no noise impacts. There would be the potential for vibration affects to the uses located above the tunnel during construction and operation.	The HST aerial structure would pass through an industrial / commercial area to the east of LAUS. Uses that abut on the ROW would be exposed to noise and vibration effects during construction and operation.	The construction and operation of a HST Station along the west bank of the Los Angeles River would have a small potential for noise and vibration affects to the surrounding industrial uses.
Visual / Scenic Resources	The aerial station and its elevated approaches would be highly visible within surrounding communities. There are industrial and commercial uses close to the aerial ROW and they would have a direct view of the aerial structures. There are also residential uses located to the southwest and north of the ROW that would have a direct line of sight of the aerial structure and station.	The aerial approaches to the station would be highly visible within surrounding communities. There are industrial and commercial uses close to the aerial ROW and they would have a direct view of the aerial structures. There are also residential uses located to the southwest and north of the ROW that would have a direct line of sight of the aerial structure and station.	An underground HST Station and approaches would not be visible and there is no potential for impacts to visual or scenic resources.	The aerial station and its elevated approaches are highly visible within surrounding communities. There are industrial and commercial uses close to the aerial ROW and they would have a direct view of the aerial structures. There are also residential uses located to the southwest and north of the ROW that would have a direct line of sight of the aerial	A West Bank HST Station would be a new aesthetic presence along the LA River. There are mainly industrial / commercial uses adjacent to the area, and there is little potential for impacts to visual / scenic resources.
Geologic / Soil Constraints	There are no known geologic or soils constraints within the area of LAUS.				
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.				

4.1.7 Conclusions

Same as Section 4.13.5 in 2009 Draft AA Report with subsections modified as noted:

A. LAUS Aerial HST Station Option

Same as Section 4.13.5.1 in 2009 Draft AA Report with addition of following text:

This option is proposed to be carried forward for analysis in the Draft EIR/EIS. Its south approaches have been modified since the Draft AA Report was released to minimize impacts to Arts District community south of LAUS.

B. LAUS At-Grade HST Station Option

Section not included in 2009 Draft AA Report and added as follows:

An at-grade HST station will likely result in reduced noise and vibration impacts and reduced community impacts when compared to the LAUS Aerial HST Option. Locating the station directly adjacent to the current LAUS will also create superior pedestrian accessibility and circulation between HST and Metrolink, Amtrak, Metro Red/Purple Line, Metro Gold Line and local fixed route bus service. This option provides equivalent pedestrian access as the underground option with significantly lower costs and fewer constructability constraints. However, this option may have greater Section 106 and 4(f) and ROW issues between LAUS and I-5 heading to the north. In addition, it would require extensive reconstruction of the existing LAUS tracks and platforms.

This option is proposed to be carried forward for analysis in the Draft EIR/EIS. It was not included in the Draft AA Report, but was developed after further consultation with area stakeholders.

C. LAUS Deep Tunnel HST Station Option

Same as Section 4.13.5.2 in 2009 Draft AA Report

D. Vignes Aerial HST Station Option

Section not included in 2009 Draft AA Report and added as follows:

Similar to an aerial LAUS station, an aerial Vignes option offers a close connection to Metrolink, Amtrak, Metro Red/Purple Line, Metro Gold Line and local fixed route bus service. This option will likely result in noise and vibration impacts, visual impacts and some community impacts. The Vignes aerial option would likely require partial acquisition of the eastern wing of Metro Headquarters, the western wing the City of Los Angeles' Piper Tech building, and the western portion of the Los Angeles County Jail.

A station above Vignes Street is not practicable because of the significant impacts to Metro and City of Los Angeles services and substantial costs for ROW acquisition and relocation, and is not recommended to be carried forward for further examination. It was not included in the Draft AA Report, but was developed after further consultation with area stakeholders.

E. West Bank Trench HST Station Option

Same as Section 4.13.5.3 in 2009 Draft AA Report

4.1.8 Options Eliminated / Carried Forward

Section 4.13.6 in 2009 Draft AA Report replaced as follows:

Options to be eliminated from further consideration:

- **LAUS Deep Tunnel HST Station Option**
- **Vignes Aerial HST Station Option**
- **West Bank Trench HST Station Option**

Options to be carried forward:

- **LAUS Aerial HST Station Option**
- **LAUS At-Grade HST Station Option**

4.2 LOS ANGELES RIVER

Section 4.12 Hobart Yard/Los Angeles River in 2009 Draft AA Report replaced as follows:

South of LAUS the HST alignment follows the LOSSAN corridor along the west side of the Los Angeles River. Two additional tracks must be added to this section to accommodate HST trains headed from Los Angeles to both Anaheim and a future segment to San Diego via the Inland Empire. There are two options to construct the HST tracks along the Los Angeles River: an at-grade option which requires the relocation of existing tracks, and an aerial option which puts the new HST tracks on a tall aerial structure which passes over the existing Los Angeles River highway bridges and requires less relocation of existing tracks.

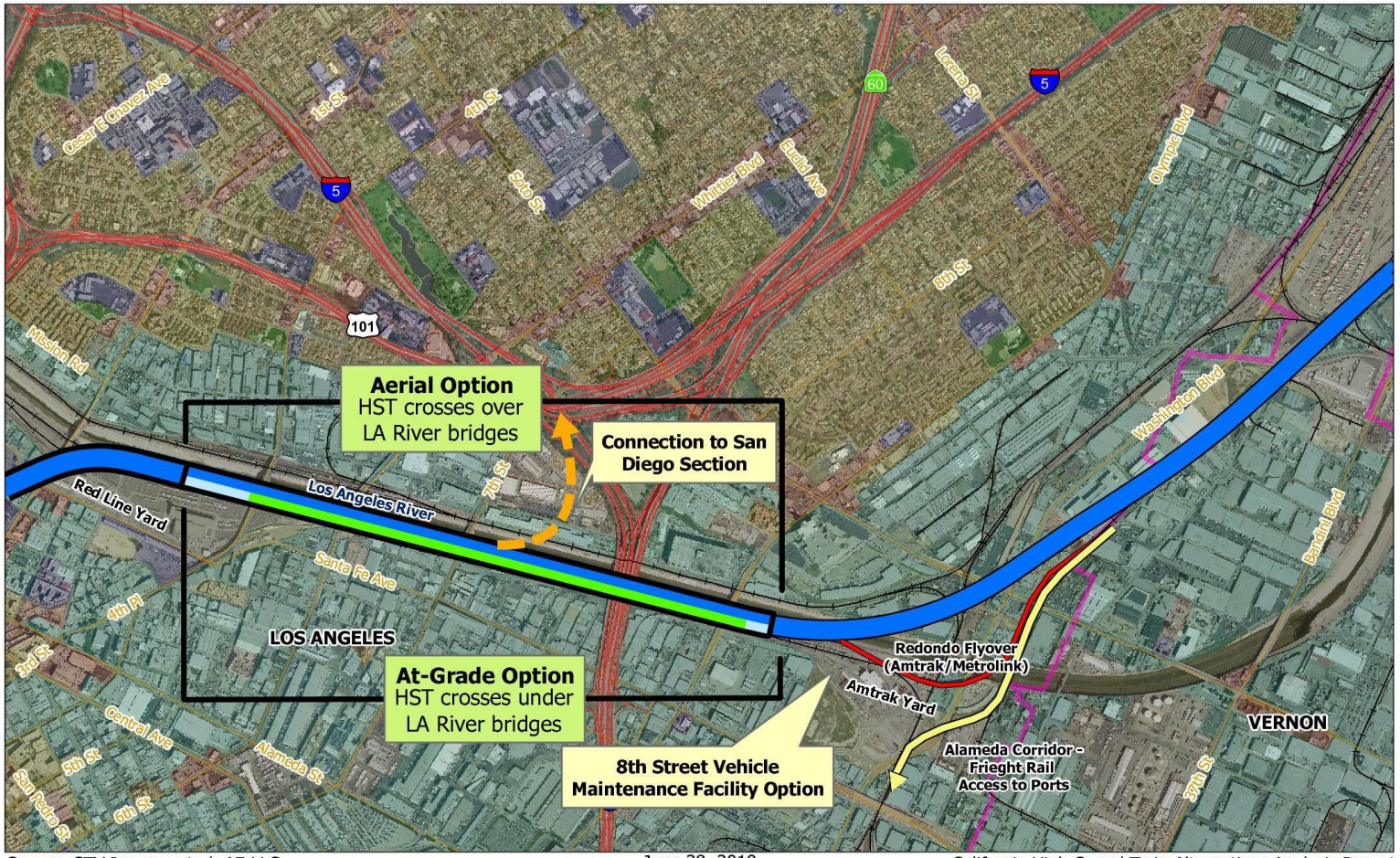
The LOSSAN corridor turns to the southeast to cross the Los Angeles River and join the BNSF San Bernardino Subdivision in the Redondo Junction area. Here, the HST tracks will diverge from the existing LOSSAN corridor to allow for a higher-speed crossing of the Los Angeles River than the existing low-speed Redondo Flyover used by Metrolink, Amtrak and freight trains. In addition, a junction for a future section of the HST project to San Diego would be located in the area just to the west of the Los Angeles River crossing.

The Draft AA included alternate alignments to the LOSSAN corridor (the Union Pacific and Washington Blvd corridors) in the area east of the Los Angeles River to accommodate the junction with the Los Angeles to San Diego section of the HST project. Subsequent design modifications have allowed the junction with the Los Angeles to San Diego HST section to be located in the vicinity of the LOSSAN corridor, and these other two options have been removed from consideration to improve operating speeds and reduce the project footprint in the area.

A tunnel crossing of the Los Angeles River was also investigated due to stakeholder comments received after the release of the Draft AA Report. Such a configuration would have a much higher cost than an aerial crossing of the Los Angeles River, and there is not a suitable location for a tunnel portal adjacent to the East Bank of the river so the tunnel would need to be at least several miles long. Due to these factors, a tunnel crossing of the Los Angeles River was not considered practicable.

An overview of the Los Angeles River area is provided in Figure 4.2-1. A complete discussion of all the constraints on the alignment between LAUS and Redondo Junction are discussed further in Appendix K.

Figure 4.2-1 Los Angeles River – Overview



Source: STV Incorporated, AE LLC

June 28, 2010

California High-Speed Train Alternatives Analysis Report

0 0.125 0.25 0.5 Miles

0 0.15 0.3 0.6 Kilometers

Legend

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

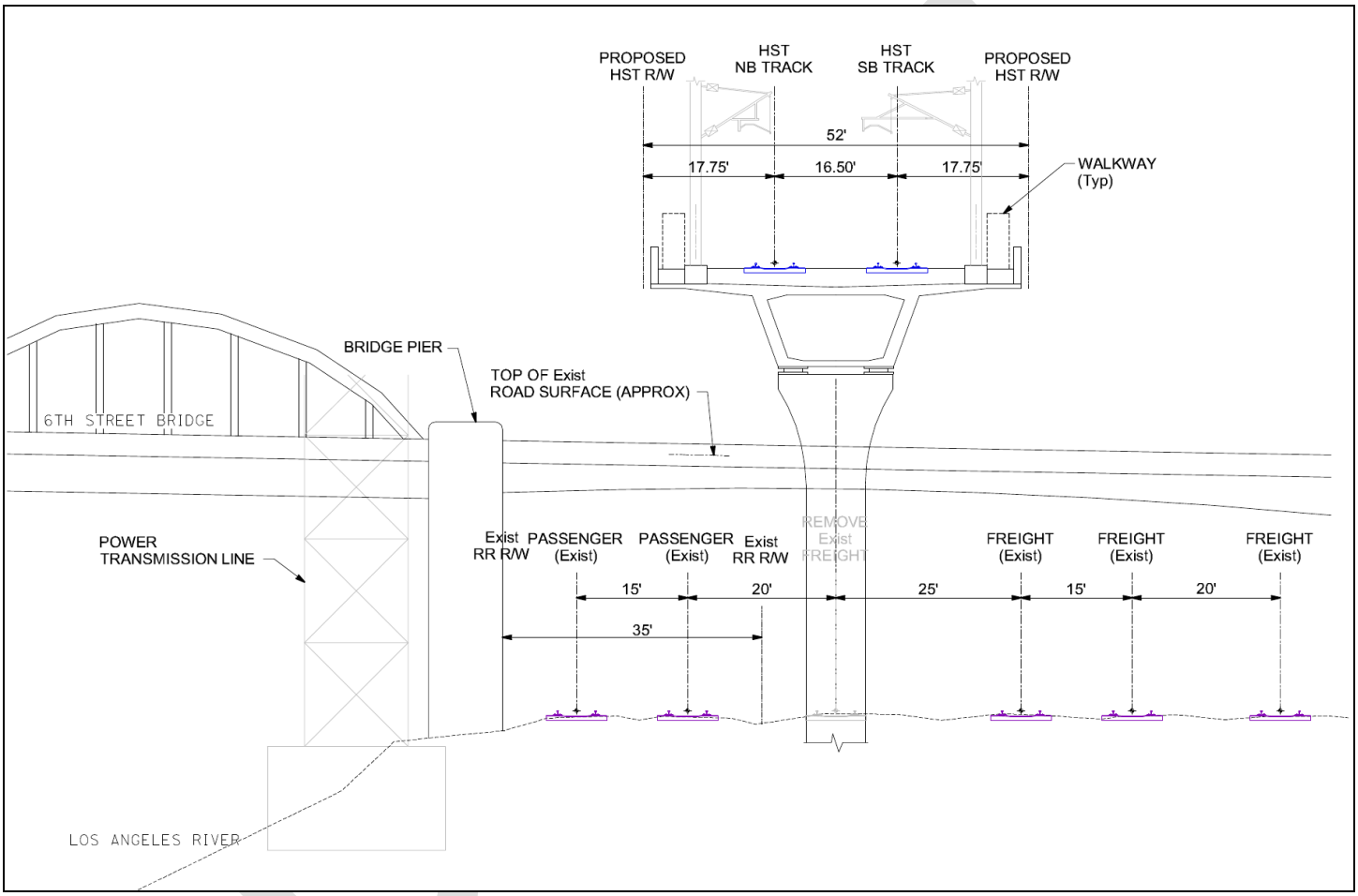
Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant
- City Boundaries

Los Angeles River
Dedicated HST Alternative - Overview

4.2.1 Tall Aerial Option

One option along the Los Angeles River is to have the aerial HST structure exiting the LAUS area (described in Section 4.1) continue to the south. Given the presence of six highway bridges over the Los Angeles River and LOSSAN corridor railroad tracks in the area, the HST structure would need to be taller than typical to clear the historic bridges. The column for the structure would require the relocation of one existing BNSF freight track. A discussion of BNSF track relocation options is presented in Section 4.2.3. A typical cross-section for this option is shown in Figure 4.2-2.

Figure 4.2-2 Typical Cross-Section – Los Angeles River – Tall Aerial Option

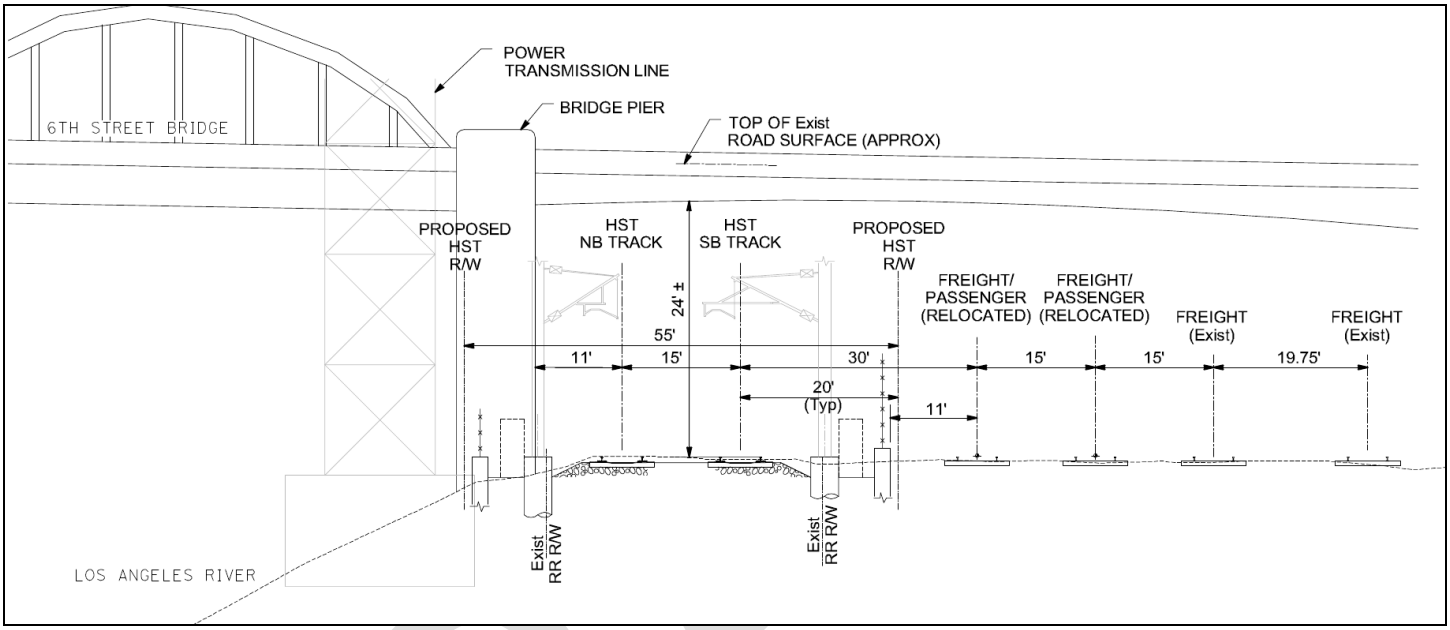


Source: STV Incorporated, 2010

4.2.2 At-Grade Option

The other option examined is to have the aerial HST structure exiting the LAUS area transition to an at-grade configuration along the west bank of the river. The at-grade alignment would be able to fit underneath the historic Los Angeles River bridges. It would require the relocated of the existing LOSSAN corridor tracks to the east, and two BNSF freight tracks to another area of the corridor as discussed in Section 4.2.3. A typical cross-section for this option is shown in Figure 4.2-3.

Figure 4.2-3 Typical Cross-Section – Los Angeles River – At-Grade Option



Source: STV Incorporated, 2010

Table 4.2-1 Evaluation Table – Los Angeles River Options

Evaluation Measure	Tall Aerial Option	At-Grade Option
Design Objectives		
Ridership / Revenue Potential	No difference between options.	
Intermodal Connections	No stations proposed in this subsection.	
Capital Costs	Larger capital costs given tall aerial structure along Los Angeles River.	Lower capital costs given at-grade construction along Los Angeles River.
Operating Costs	No difference between options.	
Operations Issues	No major operations issues.	
Land Use		
Station Area Development Potential	No stations proposed in this subsection.	
Consistency with Other Planning Efforts	No difference between options.	
Constructability		
Construction Access Issues	Constrained construction area between Los Angeles River and existing busy railroad tracks.	
Railroad Impacts	Would need to acquire one BNSF storage track along Los Angeles River. Construction impacts to existing LOSSAN corridor tracks under aerial structure during construction.	Would need to acquire two BNSF storage tracks along Los Angeles River. Potential impacts to Amtrak 8th Street Yard.
Utility Impacts	Potential issues with adjacent high-voltage power lines along Los Angeles River, which would at a similar elevation to the HST structure.	Potential issues with adjacent high-voltage power lines along Los Angeles River.
Neighborhood / ROW Impacts		
Displacements	ROW property acquisition would be needed for transitions from the LOSSAN corridor to the Los Angeles River corridor. The property affected would generally be industrial uses. A ROW purchase from BNSF (storage tracks) would also be necessary.	
Property Access Issues	No property access modifications.	
Station Area Traffic Effects	No stations proposed in this subsection.	
Grade Crossing Traffic Effects	No grade crossing modifications.	
Resource Impacts		
Waterways / Sensitive Habitat Areas	The aerial structure would span the Los Angeles River, a concrete channel, just south of Olympic Blvd. No impacts to the river bed would occur. There are no sensitive habitats in this area of the HST section.	
Cultural Resources	There is a potential for visual impacts to the historic Los Angeles River bridges. The historic bridges that the HST corridor would cross over are the First St. Bridge (1929), Fourth St. Bridge (1931), Sixth St. Bridge (1932), Seventh St. Bridge (1910/1927), and Olympic Blvd. Bridge (1925). The aerial structure would span the historic bridges, but would not cause any direct changes to the bridge structures. There is a potential that underground archaeological resources could be unearthed during excavation activities.	The at-grade HST corridor would pass under the historic bridges that span the Los Angeles River similar to the existing rail lines. The historic bridges that the HST corridor would pass under are the First St. Bridge (1929), Fourth St. Bridge (1931), Sixth St. Bridge (1932), Seventh St. Bridge (1910/1927), and Olympic Blvd. Bridge (1925). The HST tracks would be replacing BNSF storage tracks that currently cross under these historic bridges. The at-grade HST tracks would not cause any direct changes to the bridge structures. There is a potential that underground archaeological resources could be unearthed during excavation activities.
Parklands	There are no parklands within this area that would be affected.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	

Evaluation Measure	Tall Aerial Option	At-Grade Option
Environmental Impacts		
Noise / Vibration	There is a low potential for noise and vibration impacts along the Los Angeles River due to the industrial nature of the land uses and large volumes of existing railroad traffic.	
Visual / Scenic Resources	There is a potential for visual impacts to the historic Los Angeles River bridges. The historic bridges that the HST corridor would crossover are the First St. Bridge (1929), Fourth St. Bridge (1931), Sixth St. Bridge (1932), Seventh St. Bridge (1910/1927), and Olympic Blvd. Bridge (1925). The aerial structure would span the historic bridges, but would not cause any direct changes to the bridge structures.	There is little potential for visual impacts from the at-grade HST corridor that would pass under the historic bridges that span the Los Angeles River. The historic bridges that the HST corridor would pass under are the First St. Bridge (1929), Fourth St. Bridge (1931), Sixth St. Bridge (1932), Seventh St. Bridge (1910/1927), and Olympic Blvd. Bridge (1925). The HST tracks would be replacing BNSF storage tracks that currently cross under these historic bridges.
Geologic / Soil Constraints	There are no known geologic or soils constraints within this area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

4.2.3 Conclusions

The tall aerial structure would be costly and could potentially impose major visual impacts on the existing historic river bridges, as the HST alignment would cross over these culturally significant structures. In addition, it may have conflicts with the adjacent high-voltage power lines. The At-Grade alignment, on the other hand, would operate at-grade along the Los Angeles River, allowing the HST to cross underneath the historic river bridges with a lower visual impact. Both options would require the taking of one or more tracks along the Los Angeles River currently used by the BNSF to store empty container wells.

Given its potential for utility, visual, and cultural impacts, it's recommended that the Tall Aerial Option not be carried forward for further consideration and the At-Grade Option be analyzed further in the Draft EIR/EIS.

The At-Grade Option will require the rebuilding of approximately 16,000 feet / 4,877 meters (three miles / 4.9 kilometers) of BNSF storage capacity at other locations in the LOSSAN corridor. These new tracks will generally be built within the existing ROW in the cities of Commerce, Montebello, Pico Rivera and Santa Fe Springs to provide easy access to the BNSF Hobart Yard in Vernon and Commerce. The new storage tracks will be located in either the proposed fourth main track footprint or between the existing LOSSAN corridor tracks and the HST tracks.

4.2.4 Options Eliminated / Carried Forward

Options to be eliminated from further consideration:

- **Tall Aerial Option**

Options to be carried forward:

- **At-Grade Option**

4.3 VERNON / COMMERCE RAIL YARDS

Sections 4.10 and 4.11 in 2009 Draft AA Report replaced as follows:

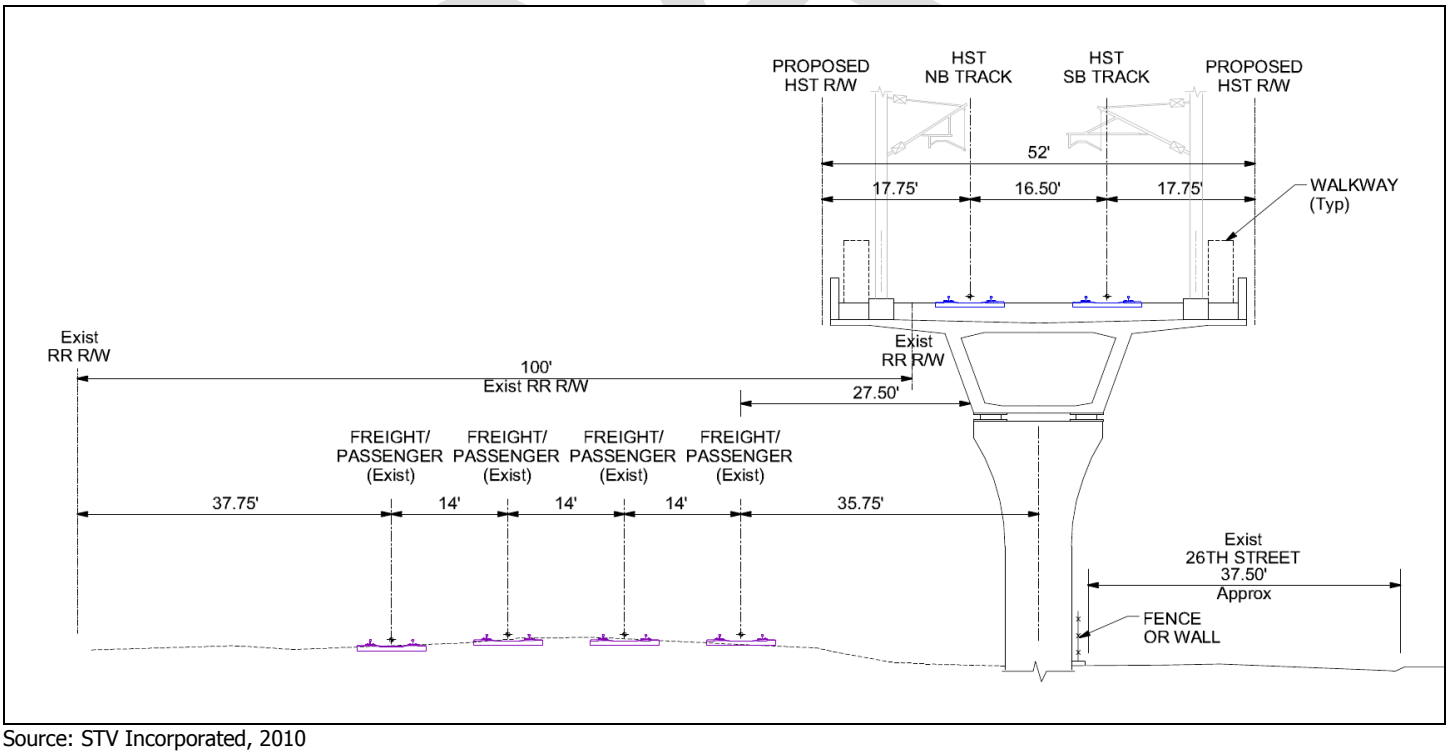
There are many freight rail tracks, yards, and spurs along the LOSSAN corridor through the industrial cities of Vernon, Bell and Commerce. In addition, the BNSF Hobart Yard and East 26th Street present major horizontal constraints for the existing LOSSAN corridor. A typical at-grade configuration discussed in Section 3.6 is not feasible for this section because of safety issues (there cannot be at-grade railroad crossings) and major ROW impact issues. Instead, an approximately 6-mile long aerial structure will be constructed from the Los Angeles River to Interstate 5 to carry the HST project over these constraints. The typical cross-section for this subsection of the project is shown in Figure 4.3-1.

The Interstate 710 crossing presents a constraint for the typical aerial alignment proposed for Vernon and Commerce. At Interstate 710, the freeway passes over the existing LOSSAN corridor tracks, and is located in the path of the proposed aerial structure. In addition, Caltrans is proposing the I-710 South project that would improve the freeway and crossing as discussed in Section 3.3.5. Potential improvements could include new general purpose and truck lanes and additional ramps near the HST crossing in Vernon to provide truck access into the nearby rail yards. A design coordination effort between the HSR and I-710 projects is underway in order to accommodate the goals of both projects without adversely impacting the other.

Two options are investigated at the I-710 crossing – an at-grade alignment and a tall aerial structure. These options are described further in the following sections.

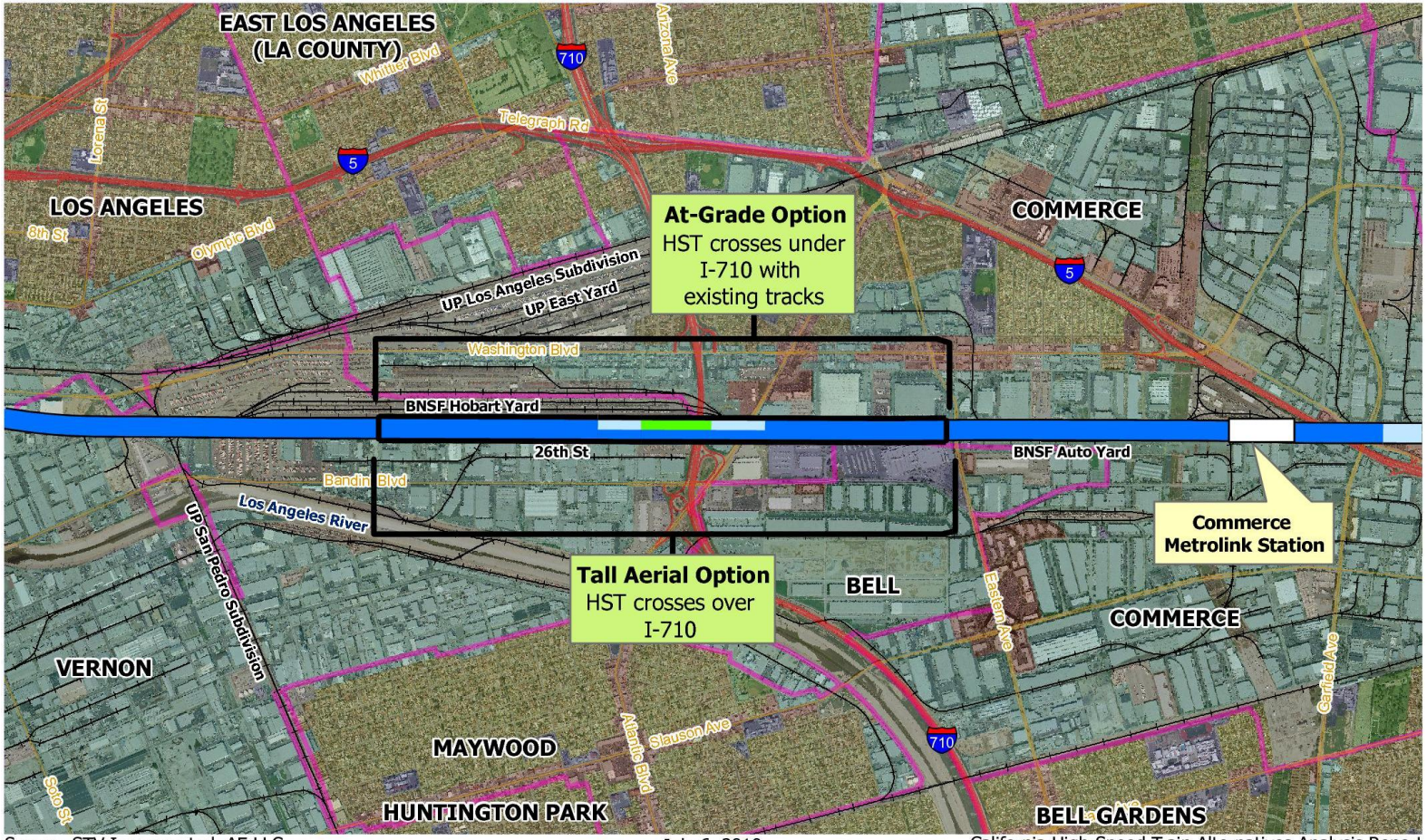
An overview of the Vernon / Commerce area and the I-710 crossing is shown in Figure 4.3-2.

Figure 4.3-1 Typical Cross-Section – Vernon / Commerce Rail Yards



Source: STV Incorporated, 2010

Figure 4.3-2 Vernon / Commerce Rail Yards – Overview



Source: STV Incorporated, AE LLC

July 6, 2010

California High-Speed Train Alternatives Analysis Report

Legend

0 0.2 0.4 0.8 Miles

0 0.2 0.4 0.8 Kilometers

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

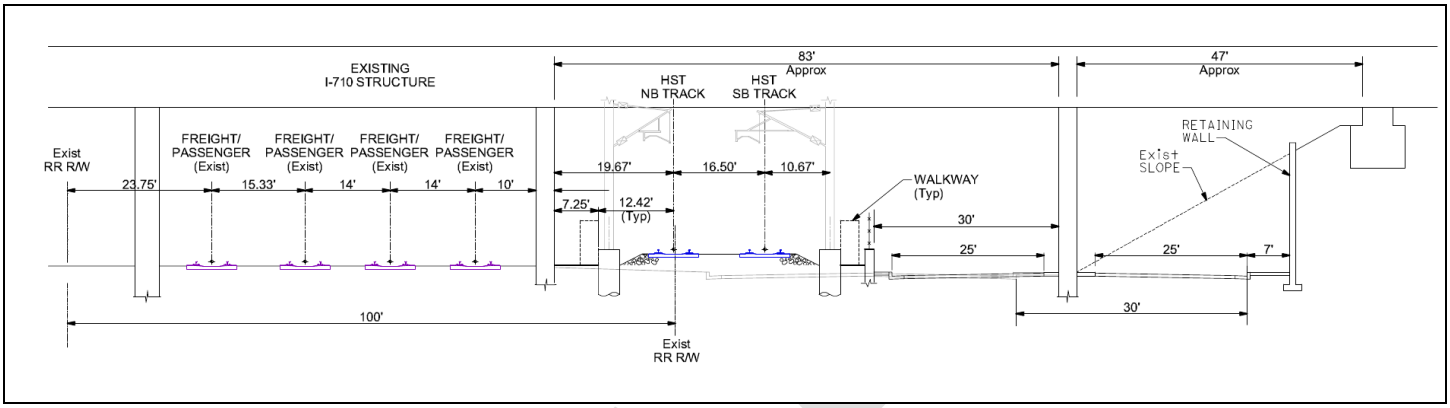
Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant
- City - Place Boundaries - Metro

Vernon / Commerce Rail Yards
Dedicated HST Alterantive - Overview

4.3.1 I-710 – At-Grade Option

One option is to go underneath I-710 at the same grade as the existing tracks. To do this, the typical aerial structure in the area would dive down to grade at the freeway crossing then return to the aerial alignment to the east. This would require several thousand feet of ROW acquisition, and the demolition and realignment of East 26th Street (which was recently widened and extended). A typical cross-section for this option is shown in Figure 4.3-3.

Figure 4.3-3 Typical Cross-Section – I-710 – At-Grade Option

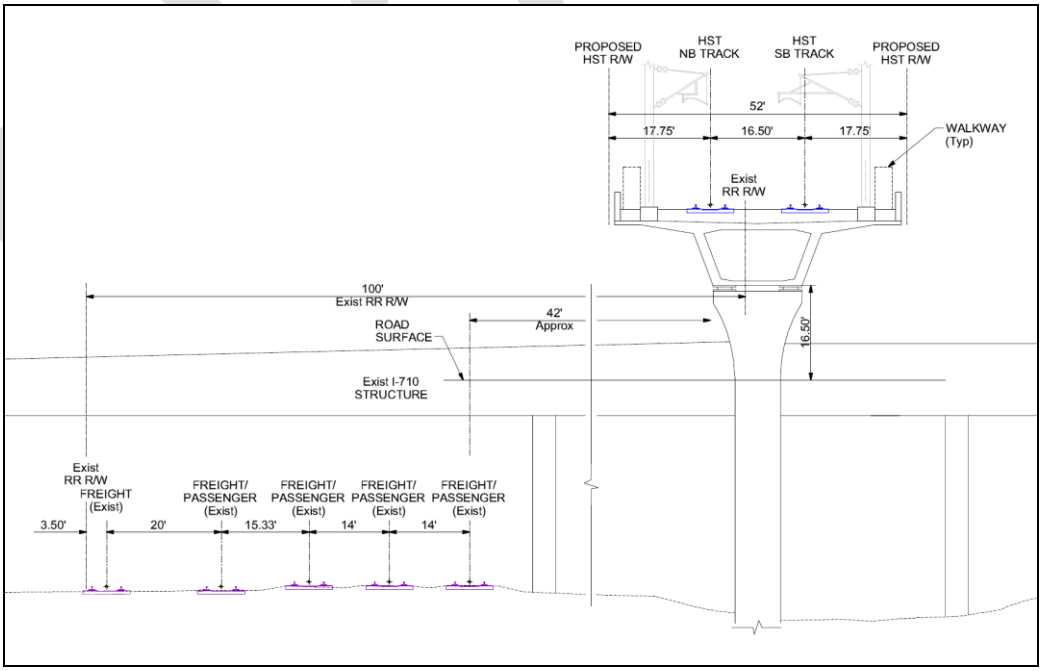


Source: STV Incorporated, 2010

4.3.2 I-710 – Tall Aerial Option

The other option at I-710 is to go over the top of the existing structure. This will require a taller aerial structure than typical for the I-710 crossing and approaches. A typical section for this option is shown in Figure 4.3-4.

Figure 4.3-4 Typical Cross-Section – I-710 – Tall Aerial Option



Source: STV Incorporated, 2010

Table 4.3-1 Evaluation Table – I-710 Options

Evaluation Measure	At-Grade Option	Tall Aerial Option
Design Objectives		
Ridership / Revenue Potential	No difference between options.	
Intermodal Connections	No stations proposed in this subsection.	
Capital Costs	Lower costs for at-grade construction, but large costs to relocate 26th Street and relocate businesses.	Higher costs for tall aerial structure, but fewer relocations.
Operating Costs	No difference between options.	
Operations Issues	No major operations issues.	
Land Use		
Station Area Development Potential	No stations proposed in this subsection.	
Consistency with Other Planning Efforts	No inconsistencies with other planning efforts.	Design coordination with I-710 South Project minimizes potential issues with configurations of both projects through this area.
Constructability		
Construction Access Issues	Adjacent 26th St and I-710 should allow for sufficient construction access.	
Railroad Impacts	No major impacts expected.	Construction issues for building aerial structure above existing tracks.
Utility Impacts	Several utility crossings in area. No expected difference between options.	
Neighborhood / ROW Impacts		
Displacements	Option would require relocating 26th Street to the south and acquiring property from approximately Indiana Street to Atlantic Boulevard. Displacements are generally the front parking areas of industrial / commercial properties.	Temporary displacements possibly needed during construction, otherwise structure is above existing railroad and roadway ROW.
Property Access Issues	Property access to relocated 26th Street would need to be modified for most parcels between Indiana Street and Atlantic Boulevard.	No access issues anticipated.
Station Area Traffic Effects	No HST stations are proposed at this subsection location.	
Grade Crossing Traffic Effects	Would require relocation of recently constructed 26th Street bridge (adjacent to LOSSAN corridor tracks) over Atlantic Blvd	No grade crossing effects anticipated.
Resource Impacts		
Waterways / Sensitive Habitat Areas	There are no waterways or sensitive habitats within this area that would be affected.	
Cultural Resources	There are no cultural resources within this area that would be affected.	
Parklands	There are no parklands within this area that would be affected.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	
Environmental Impacts		
Noise / Vibration	There is a low potential for noise and vibration impacts in this area due to the heavy industrial nature of the surrounding land uses.	
Visual / Scenic Resources	There is a low potential for visual / scenic resource impacts in this area due to the heavy industrial nature of the surrounding land uses.	
Geologic / Soil Constraints	There are no known geologic or soils constraints within this area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

4.3.3 Conclusions

The at-grade option would require the demolition and realignment of several thousand fee of 26th Street, forcing the relocation of many businesses along this corridor. The at-grade alignment would also require the reconstruction of the newly built 26th Street bridge over Atlantic Boulevard. The tall aerial structure would result in fewer property displacements, and ongoing design coordination activities with the I-710 South project should ensure minimal conflicts between the designs of the two projects.

Due to the need for extensive right-of-way acquisitions and potential traffic impacts to 26th Street, the At-Grade Option has not been carried forward for further consideration and only the Tall Aerial Option will be carried forward for further examination in the Draft EIR/EIS.

4.3.4 Options Eliminated / Carried Forward

Options to be eliminated from further consideration:

- **At-Grade Option**

Options to be carried forward:

- **Tall Aerial Option**

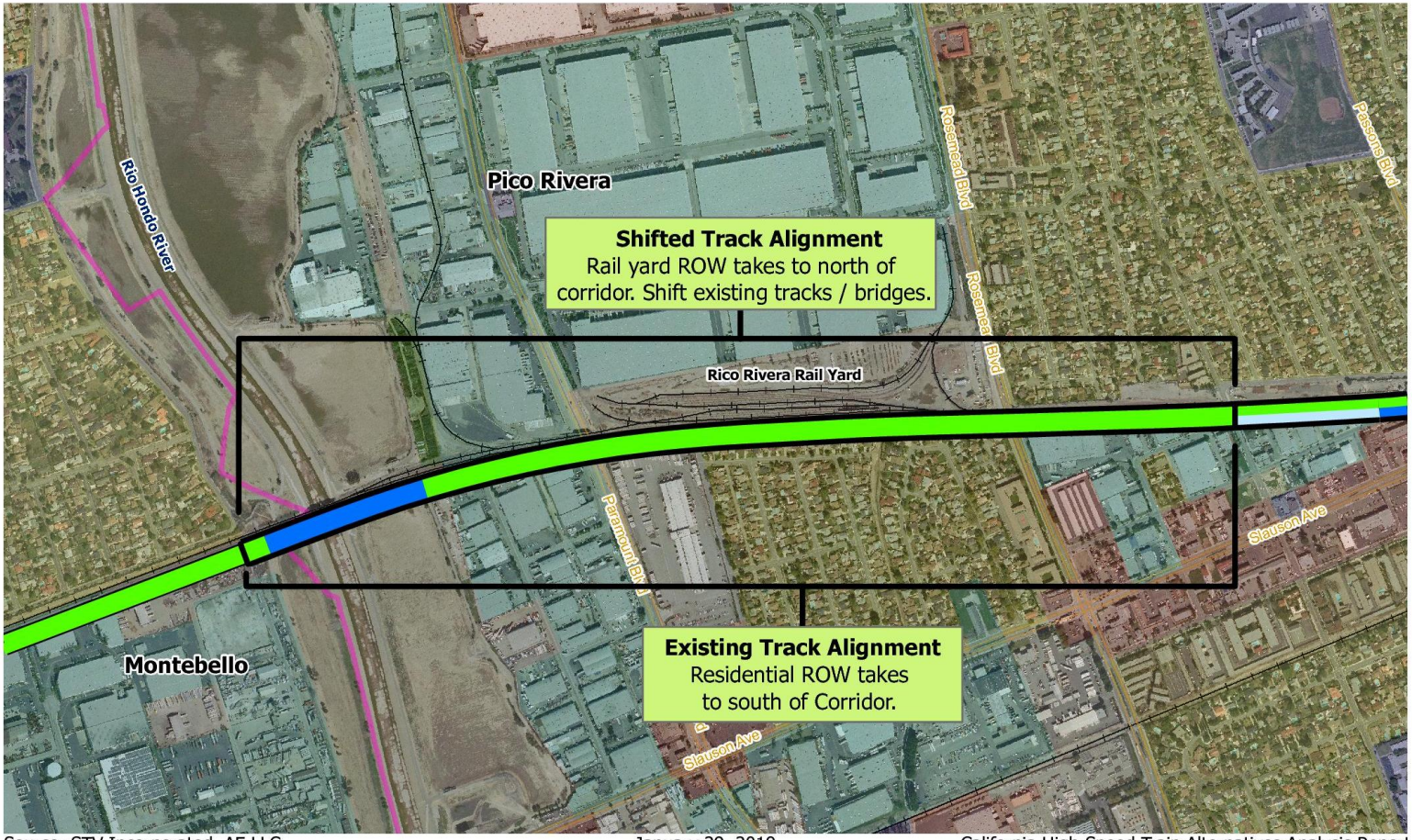
4.4 PICO RIVERA RAIL YARD

Section not included in 2009 Draft AA Report and added as follows:

HST tracks are typically proposed on the south/west side of the LOSSAN Corridor between Los Angeles and Fullerton to take advantage of more favorable adjacent land uses and fewer impacts to existing rail operations. Generally, the existing LOSSAN corridor tracks will be left in their existing locations to minimize impacts to railroad operations. However, two options for constructing the HST tracks and acquiring the necessary right-of-way are being explored in the Pico Rivera Rail Yard area, one of which involves shifting the existing tracks. The Pico Rivera Rail Yard area has been developed after further design work in the area.

The first option involves using the typical cross-section through the area, leaving the existing tracks in place and taking ROW from the south, where there are residential properties. The second option involves a shifted track alignment and the taking of right-of-way from the north – the location of the Pico Rivera Rail Yard. This second option would require the shifting of all LOSSAN Corridor and HST tracks to the north. These options are described in more detail in Sections 4.4.1 and 4.4.2. An overview of the Pico Rivera Rail Yard is provided in Figure 4.4-1. The options are evaluated in Table 4.4-1.

Figure 4.4-1 Pico Rivera Rail Yard – Overview



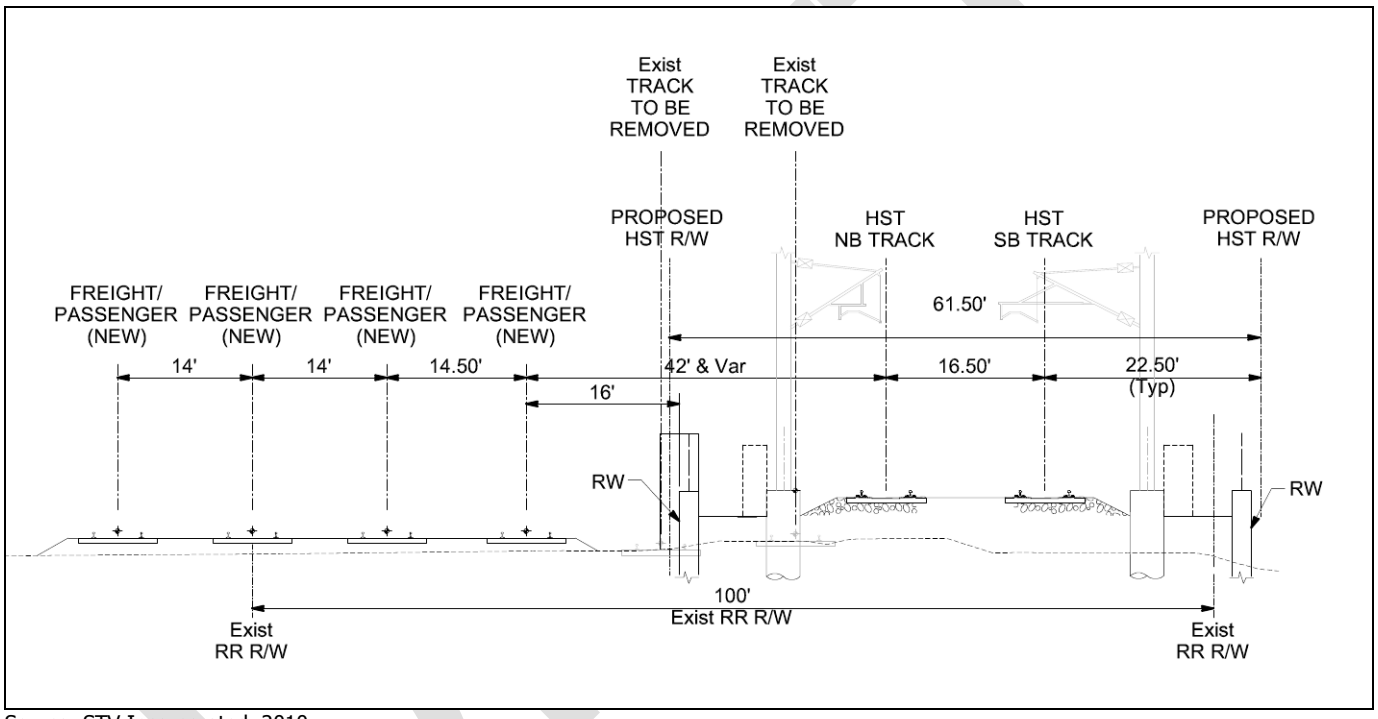
4.4.1 Existing Track Alignment Option

One option is to build the two HST tracks at grade using the typical cross-section for the corridor, as shown in Section 3.6. This would preserve the existing LOSSAN corridor tracks and bridges, but require the taking of approximately 30 residential properties to the south of the LOSSAN corridor.

4.4.2 Shifted Track Alignment Option

Another option is to shift the existing LOSSAN corridor tracks to the north, place the HST tracks in the existing ROW, and acquire minimal additional ROW to the south of the corridor. This would minimize the acquisition of residential property, but require reconfiguration of the Pico Rivera Rail Yard, the existing LOSSAN corridor tracks, and bridges over Paramount and Rosemead Boulevards. A typical cross-section for this option is shown in Figure 4.4-2.

Figure 4.4-2 Typical Cross-Section – Pico Rivera Rail Yard – Shifted Track Alignment Option



Source: STV Incorporated, 2010

Table 4.4-1 Evaluation Table – Pico Rivera Rail Yard Options

Evaluation Measure	Existing Track Alignment Option	Shifted Track Alignment Option
Design Objectives		
Ridership / Revenue Potential	No difference between options.	
Intermodal Connections	No stations proposed in this subsection.	
Capital Costs	Requires residential property acquisitions – approximately 30 houses.	Requires rail yard acquisitions, potential acquisition of 9 houses and the reconfiguration of lead tracks and bridges over Paramount and Rosemead Boulevards.
Operating Costs	No difference between options.	
Operations Issues	No major operations issues.	
Land Use		
Station Area Development Potential	No stations proposed in this subsection.	
Consistency with Other Planning Efforts	No inconsistencies with other planning efforts.	
Constructability		
Construction Access Issues	Paramount and Rosemead Boulevards will allow for construction access in area.	
Railroad Impacts	No major impacts expected, as existing services and tracks preserved.	Requires shifting and reconfiguration of LOSSAN corridor tracks and Pico Rivera yard. Potential construction impacts as well as permanent yard operations impacts.
Utility Impacts	Several utility crossings in area. No expected difference between options.	
Neighborhood / ROW Impacts		
Displacements	Requires residential property acquisitions – approximately 30 houses.	Requires rail yard acquisition and potential acquisition of 9 houses. Acquisition of a small amount of ROW likely needed on south side of corridor.
Property Access Issues	No major changes in property access expected.	
Station Area Traffic Effects	No HST stations are proposed in this subsection.	
Grade Crossing Traffic Effects	No at-grade crossings in area. Potential temporary construction impacts to Paramount and Rosemead Boulevards when constructing new HST bridge adjacent to existing railroad bridge.	
Resource Impacts		
Waterways / Sensitive Habitat Areas	Both options cross Rio Hondo and adjacent detention basins on new bridge adjacent to existing railroad bridge. There are no sensitive habitats in this area that would be affected.	
Cultural Resources	There are no cultural resources within this area that would be affected.	
Parklands	There are no parklands within this area that would be affected.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	
Environmental Impacts		
Noise / Vibration	Potential sensitive receptors in residential neighborhoods to north and south of alignment. Option would move freight tracks closer to residential properties north of alignment and east of Rosemead Boulevard.	Potential sensitive receptors in residential neighborhoods to north and south of alignment. Option would require acquisition of approximately 30 homes, and move tracks closer to additional residences to south of corridor.
Visual / Scenic Resources	There are no known visual or scenic resources within this area.	
Geologic / Soil Constraints	There are no known geologic or soils constraints within this area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

4.4.3 Conclusions

The existing track alignment would maintain the typical HST configuration, where the HST tracks would be constructed (and ROW acquired) to the south of the LOSSAN Corridor. Existing rail facilities in the area would not be affected. However, this option would result in the need to acquire approximately 30 houses that abut the south side of the ROW. The shifted track alignment would avoid acquisition of these residential properties, but would require acquisition of a portion or all of the Pico Rivera Rail Yard and potentially some residential properties to the north of the corridor. This option would also likely require the reconfiguration of lead tracks and the Paramount Avenue and Rosemead Avenue bridges.

Due to the potential community impacts of acquiring residential properties, the Existing Track Alignment Option has not been carried forward for further consideration and only the Shifted Track Alignment Option will be carried forward for further examination in the Draft EIR/EIS.

4.4.4 Options Eliminated / Carried Forward

Options to be eliminated from further consideration:

- **Existing Track Alignment Option**

Options to be carried forward:

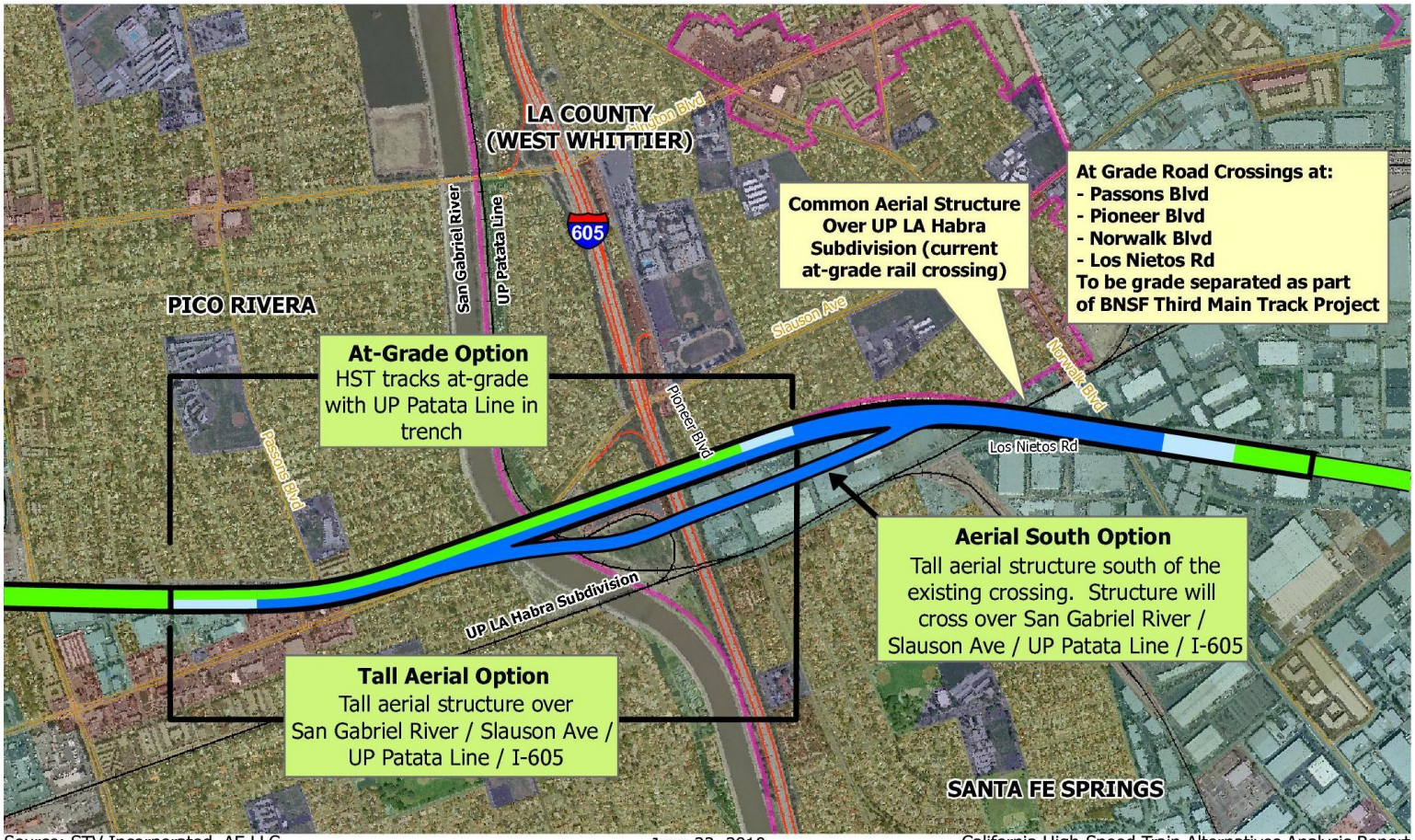
- **Shifted Track Alignment Option**

4.5 DT JUNCTION AREA

Same as Section 4.9 in 2009 Draft AA Report with additional design option analyzed as noted

Overview Figure 4.21 in 2009 Draft AA Report replaced with Figure 4.5-1

Figure 4.5-1 DT Junction Area – Overview



Source: STV Incorporated, AE LLC June 23, 2010 California High-Speed Train Alternatives Analysis Report

Legend

0 500 1,000 2,000 Feet
0 165 330 660 Meters

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant
- City Boundaries

DT Junction Area
Dedicated HST Alternative - Overview

4.5.1 At-Grade Option

Same as Section 4.9.1 in 2009 Draft AA Report

4.5.2 Tall Aerial Option

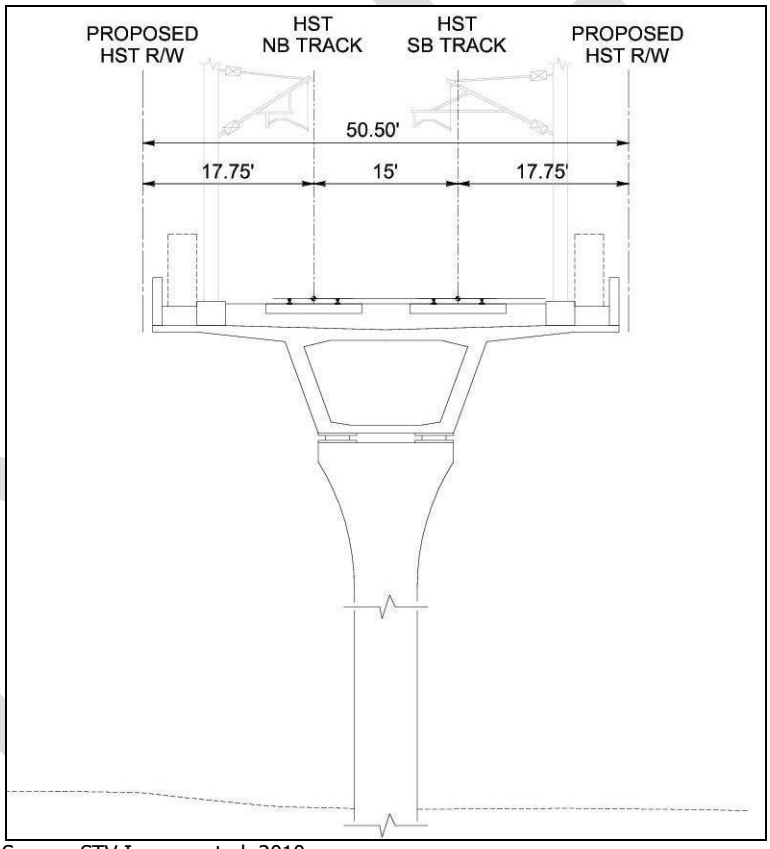
Same as Section 4.9.2 in 2009 Draft AA Report

4.5.3 Aerial South Option

Section not included in 2009 Draft AA Report and added as follows:

The final option will deviate south from the LOSSAN Corridor just to the west of Slauson Avenue and cross the DT Junction area on a new tall aerial structure. The Aerial South Option would pass over the San Gabriel River, Slauson Avenue, UP Patata Line and I-605. The structure would need to be approximated 65' (19.8 meters) high to pass over I-605 and Slauson Avenue. A typical cross-section for this option in the DT Junction area is shown in Figure 4.5-2.

Figure 4.5-2 Typical Cross-Section – DT Junction Area – Aerial South Option



Source: STV Incorporated, 2010

4.5.4 Evaluation Table

Evaluation Table 4.9.3 in 2009 Draft AA Report replaced with Table 4.5-1

Table 4.5-1 Evaluation Table – DT Junction Area Options

Evaluation Measure	At-Grade Option	Tall Aerial Option	Aerial South Option
Design Objectives			
Ridership / Revenue Potential	No difference between options.		
Intermodal Connections	No stations proposed in this subsection.		
Capital Costs	Less significant structures will make this option less expensive than the tall aerial structure	Long, tall aerial structures are more expensive than smaller structures for other options.	
Operating Costs	No difference between options.		
Operations Issues	No major operations issues		
Land Use			
Station Area Development Potential	No stations proposed in this subsection.		
Consistency with Other Planning Efforts	No difference between options.		
Constructability			
Construction Access Issues	Passons, Pioneer, and Norwalk Boulevards will allow for construction access in area.		
Railroad Impacts	Requires placing UP Patata Line in trench under LOSSAN corridor. To allow for proper clearances under LOSSAN corridor bridge, grades for approaches to trench will be too steep to allow for continuing UP freight operations. Raising of LOSSAN corridor tracks to allow for shallower trench requires extensive reconstruction of existing Slauson Avenue bridge and LOSSAN corridor crossing of San Gabriel River (a very difficult construction process if the LOSSAN corridor and Slauson Avenue bridge are to be kept in service).	Likely temporary construction issues for LOSSAN corridor tracks underneath tall aerial structure.	
Utility Impacts	Several utility crossings in area. Potential conflicts between HST overhead contact system (OCS) and high-voltage power lines to west of DT Junction.	Several utility crossings in area. Potential conflicts between HST tall aerial structure and high-voltage power lines to west of DT Junction.	
Neighborhood / ROW Impacts			
Displacements	Need to acquire property adjacent to ROW. Generally industrial land uses on south side of corridor.	Need to acquire some ROW for aerial HST structure. Generally industrial land uses on south side of corridor.	Need to acquire industrial properties to the south of the LOSSAN corridor and north of UP La Habra Subdivision.
Property Access Issues	Minimal property access issues. Roadway connecting Pioneer Blvd to area west of I-605 may be impacted by HST footprint.		
Station Area Traffic Impacts	No HST stations are proposed at this subsection location.		

Evaluation Measure	At-Grade Option	Tall Aerial Option	Aerial South Option
Grade Crossing Traffic Effects	Current at-grade crossings at Passons Blvd, Pioneer Blvd, Norwalk Blvd, and Los Nietos Rd to be grade separated as part of BNSF Third Main Track Project. Potential temporary construction impacts for all crossings when constructing new HST bridge adjacent to existing railroad bridge.	Current at-grade crossings at Passons Blvd, Pioneer Blvd, Norwalk Blvd, and Los Nietos Rd to be grade separated as part of BNSF Third Main Track Project. No grade crossing effects anticipated.	
Resource Impacts			
Waterways / Sensitive Habitat Areas	There are potential flood plain issues with building a trench next to the San Gabriel River. The San Gabriel River has potential sensitive habitat that could be impacted by a HST crossing.	The San Gabriel River has potential sensitive habitat that could be impacted by a HST crossing.	
Cultural Resources	There are older single-family (SF) residential uses on the north side of the LOSSAN corridor north of Los Nietos Rd. An aerial structure could have a potential impact on cultural resources in this area. There is a minor potential for impacts to cultural resources by putting the Patata Line in a trench.	There are older SF residential houses on the north side of the LOSSAN corridor within the DT Junction area. An aerial structure could have a potential impact on cultural resources in this area by changing the historic visual context of the surrounding landscape.	There are older SF residential houses on the north side of the LOSSAN corridor within the DT Junction area. An aerial structure to the south would have potentially less impact on cultural resources in this area than that of the other aerial option, which is closer to the residential houses.
Parklands	There are recreational trails along the San Gabriel River that are not expected to be affected by the project.		
Agricultural Lands	There are no agricultural lands in the DT Junction area.		
Environmental Impacts			
Noise / Vibration	There a potential for noise and vibration impacts during construction and operation to the SF residential neighborhood located on the north side of LOSSAN corridor.		
Visual / Scenic Resources	An aerial structure at the La Habra Subdivision would have the potential to impact visual and scenic resources in the SF residential neighborhood on the north side of the LOSSAN corridor.	A tall aerial structure would be highly visible within the surrounding residential community, and would have potential impacts by its sheer size and visibility, by blocking views, and by casting shadows onto surrounding residential properties particularly during the fall and winter months.	A tall aerial structure would be highly visible within the surrounding residential community, and would have potential impacts by its sheer size and visibility, by blocking views, and by casting shadows onto surrounding residential properties particularly during the fall and winter months. That being said, this option would have fewer residential impacts than the first aerial option because it is located further south and away from the SF residential houses.
Geologic / Soil Constraints	There are no known geologic or soils constraints in the DT Junction area.		
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.		

4.5.5 Conclusions

Section 4.9.4 in 2009 Draft AA Report replaced as follows:

The at-grade option at DT Junction can utilize the most existing infrastructure, but will require a major change in operations in the DT Junction area (especially for the UP) and a difficult excavation process. The excessive grades required for the UP Patata Line to be sunk into a trench will not allow for continued UP freight operation on the line. The two aerials options have similar potential benefits and impacts in most categories. The Tall Aerial Option and the South Aerial Option will require a large aerial structure with visual and noise impacts, but have few other impacts. The South Aerial Option is located further from the residential neighborhoods of unincorporated West Whittier, but will require property acquisitions as it leaves the LOSSAN corridor.

Both the aerial options will be carried forward for further examination in the Draft EIR/EIS, with a focus on transportation, construction and visual impacts in the area. The at-grade option will not be carried forward for further consideration due to its impacts to existing railroad operations. The at-grade option was recommended to be carried forward in the 2009 Draft AA Report, but has been found impracticable and eliminated in this Supplemental AA Report after further design work was completed and its impacts to railroad operations further detailed.

4.5.6 Options Eliminated / Carried Forward

Section 4.9.5 in 2009 Draft AA Report replaced as follows:

Options to be eliminated from further consideration:

- **At-Grade Option**

Options to be carried forward:

- **Tall Aerial Option**
- **South Aerial Option**

4.6 NORWALK / SANTA FE SPRINGS STATION

Same as Section 4.8 in 2009 Draft AA Report with modifications as noted

4.6.1 No HST Station Option

Same as Section 4.8.1 in 2009 Draft AA Report

4.6.2 East HST Station Option

Same as Section 4.8.2 in 2009 Draft AA Report

4.6.3 North HST Station Option

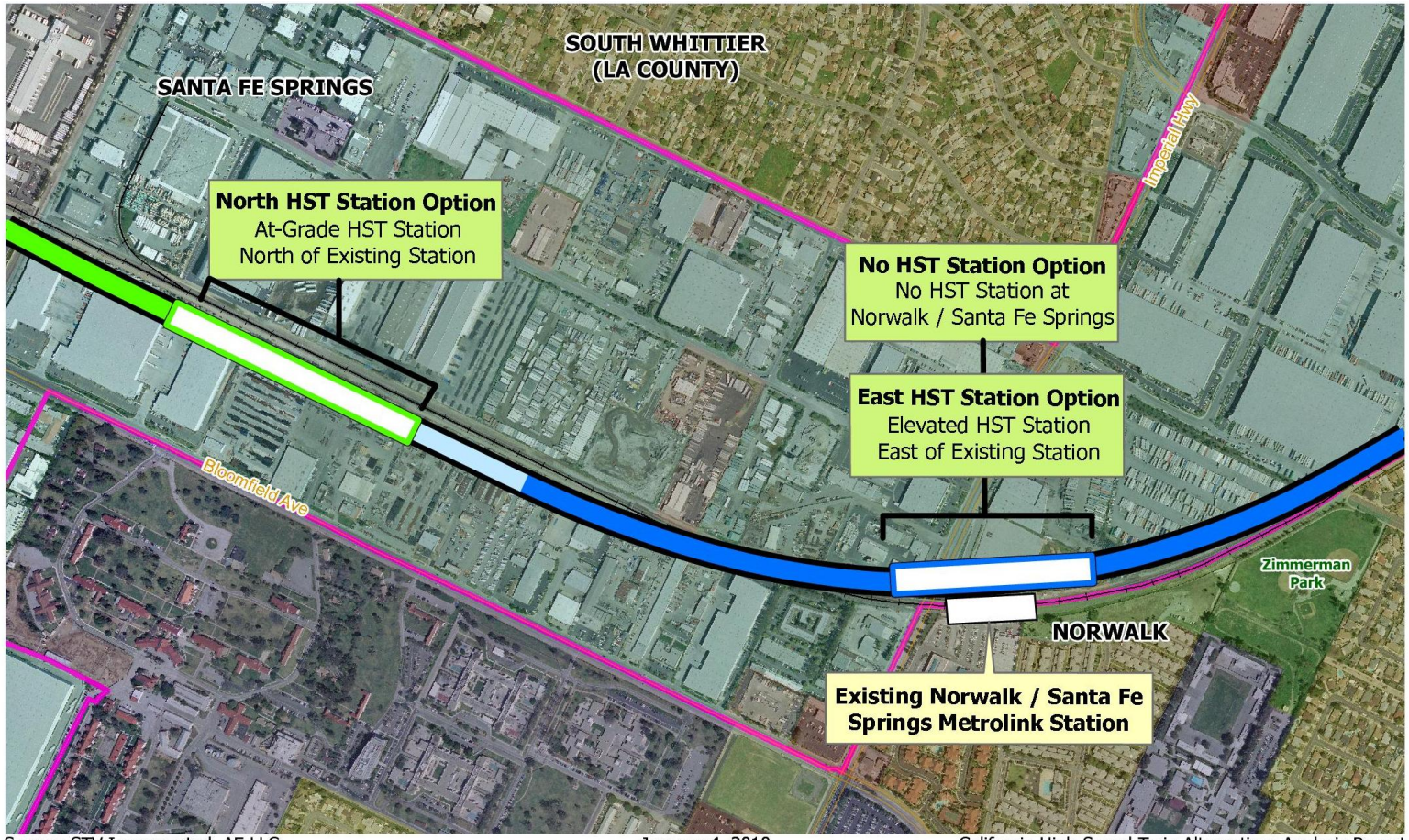
Same as Section 4.8.3 in 2009 Draft AA Report

4.6.4 Overview Figure and Evaluation Table

Figure 4.18 in 2009 Draft AA Report replaced with Figure 4.6-1

Evaluation Table 4.8.4 in 2009 Draft AA Report replaced with Table 4.6-1

Figure 4.6-1 Norwalk / Santa Fe Springs Station – Overview



Source: STV Incorporated, AE LLC

January 4, 2010

California High-Speed Train Alternatives Analysis Report

Legend

0 300 600 1,200 Feet

0 75 150 300 Meters

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

City Boundaries

Norwalk / Santa Fe Springs Station Area
Dedicated HST Alternative - Overview

Table 4.6-1 Evaluation Table – Norwalk / Santa Fe Springs Station

Evaluation Measure	No HST Station Option	East HST Station Option	North HST Station Option
Design Objectives			
Ridership / Revenue Potential	No riders can access HST system at Norwalk / Santa Fe Springs.	Norwalk / Santa Fe Springs HST station serves northern Orange County, southern Los Angeles County, western Riverside and San Bernardino counties.	
Intermodal Connections	No access to HST from other modes at station.	Allows for transfers to Metrolink and buses via pedestrian walkway. Potential connection to Los Angeles International Airport (LAX).	Does not allow for easy connections to Metrolink trains at existing station, approximately ½ mile to south. But, connections to Metrolink at this station are expected to be minimal given the lack of Metrolink stations between Norwalk / Santa Fe Springs and LAUS (Commerce station is only served by limited number of trains). Most transfers between Metrolink and HST system in Los Angeles County expected to take place at LAUS. Potential connection to LAX.
Capital Costs	Addition of new tracks to east of existing tracks. Minor ROW displacements.	Capital costs include the cost of an aerial structure with straight station platforms, property acquisitions and station expenses (generally minimal), as existing station facilities would be available for HST use.	Capital costs include the cost of a new at-grade station and property acquisitions.
Operating Costs	At-grade construction without HST station minimizes costs in area.	HST station is more expensive to operate than at-grade, no-station option. Similar operating costs for two HST station options.	
Operations Issues	No major operations issues foreseen.	Curves into HST station will be sharper than existing curve to allow for straight station tracks. Since all HSTs are projected to stop at station, this will result in only a minimal travel time increase.	No major operations issues foreseen.
Land Use			
Station Area Development Potential	There will not be a HST station in this area to stimulate station area development.	Both HST station options would allow for some development of surrounding area, which is mainly made up of industrial and commercial uses. Norwalk and Santa Fe Springs have expressed minimal interest in developing station area.	
Consistency with Other Planning Efforts	No major planning efforts underway in station area.		
Constructability			
Construction Access Issues	Existing station and road crossings provide access for construction activities in area.		
Railroad Impacts	Likely temporary construction issues for LOSSAN corridor tracks underneath long skewed aerial crossing in Imperial Highway vicinity.		
Utility Impacts	Several utility crossings in area. Several large underground oil pipelines cross LOSSAN corridor in existing Metrolink station vicinity.		

Evaluation Measure	No HST Station Option	East HST Station Option	North HST Station Option
Neighborhood / ROW Impacts			
Displacements	Acquisition of small number of properties to east of existing tracks through Metrolink station area would be needed.	Acquisition of large industrial parcels both north and south of Imperial Highway would be needed. Acquisitions of at least eight industrial buildings and a large number of parking spaces and trailer storage areas are expected.	To locate HST Station to the north of the existing Norwalk / Santa Fe Springs Station would require the acquisition of large industrial parcels on the west side of the LOSSAN corridor, likely including two industrial buildings, a large number of parking spaces and storage areas.
Property Access Issues	HST tracks may require minor property access changes in vicinity of Imperial Highway crossing.		
Station Area Traffic Effects	There will not be a HST station in this area to affect traffic.	Construction and operation of a HST station would induce large numbers of new auto and transit trips in the Norwalk / Santa Fe Springs station area.	
Grade Crossing Traffic Effects	Current at-grade crossing at Lakeland Road to be grade separated as part of BNSF Third Main Track Project. Potential temporary construction impacts for all crossings when constructing new HST bridge adjacent to existing railroad bridge.		
Resource Impacts			
Waterways / Sensitive Habitat Areas	There are no waterways or sensitive habitats within this area that would be affected.		
Cultural Resources	There are no known cultural resources within this area that would be affected.		
Parklands	Zimmerman Park is located south of existing station on the west side of the LOSSAN corridor. Zimmerman Park is specifically designed for baseball / softball games; there are no other recreational facilities on the park site. Construction and operation of a HST Station either to the east or north of the existing station would have potential to impact the use of the park.		
Agricultural Lands	There are no agricultural lands within this area that would be affected.		
Environmental Impacts			
Noise / Vibration	Multi-family (MF) residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment noise impacts.	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment and station noise impacts.	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment noise impacts. The area surrounding the HST station option is generally industrial.
Visual / Scenic Resources	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment visual impacts.	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment and station visual impacts.	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment visual impacts. The area surrounding the HST station option is generally industrial.
Geologic / Soil Constraints	There are no known geologic or soils constraints within the area.		
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.		

4.6.5 Conclusions

Section 4.8.5 in 2009 Draft AA Report replaced as follows:

The at-grade, no HST station option would likely have lower costs and fewer environmental impacts than either of the station options, but does not provide for HST service at Norwalk / Santa Fe Springs. The station options to the east and north of the existing Metrolink station provide service and access to Norwalk and Santa Fe Springs, but cost more than the No HST Station option and will require extensive ROW acquisition and relocations. The station option to the east of the existing station provides the best connections to Metrolink but could cause noise and visual impacts. The HST station option to the north of the existing station requires a long connection (approximately 1,200' / 366 meters) to other operators at the existing station and has large property impacts to industrial parcels on either side of the track.

Due to its poor connections to existing transit lines and property impacts, the North HST Station Option is recommended for elimination. The No HST Station Option and East HST Station Option are recommended to be carried forward for further examination in the Draft EIR/EIS, with a focus on comparing the Norwalk / Santa Fe Springs station option to the Fullerton HST station option discussed in Section 4.9. Prior recommendations in the Draft AA Report that the East HST Station Option be eliminated and the North HST Station Option be carried forward are changed in this Supplemental AA Report due to modifications to the HST design criteria and further consultation with stakeholders in the area.

4.6.6 Options Eliminated / Carried Forward

Section 4.8.6 in 2009 Draft AA Report replaced as follows:

Options to be eliminated from further consideration:

- **North HST Station Option**

Options to be carried forward:

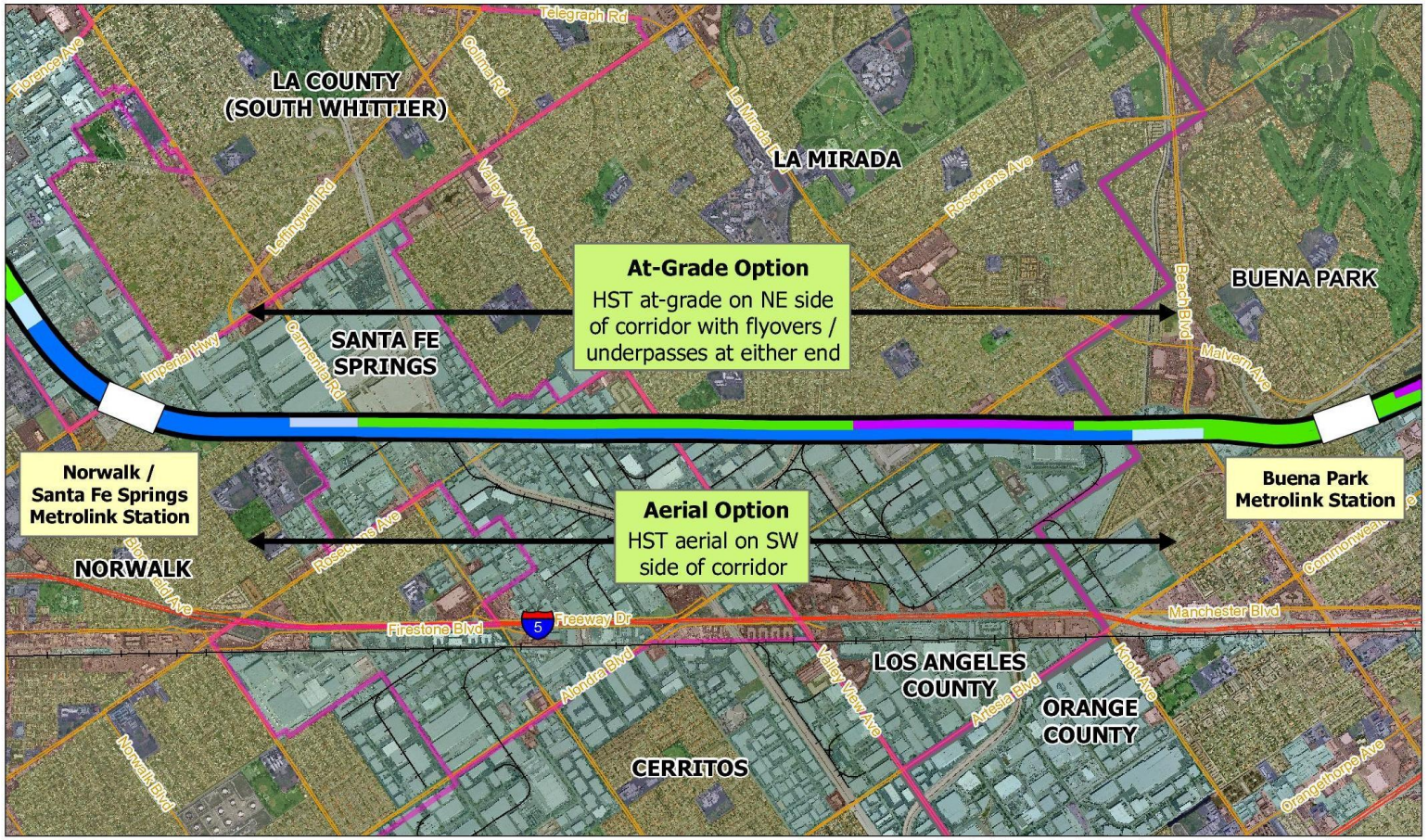
- **No HST Station Option**
- **East HST Station Option**

4.7 LA MIRADA RAIL YARDS

Section 4.7 in 2009 Draft AA Report replaced as follows:

There are a large number of freight rail spurs, industrial tracks and yards through southern Santa Fe Springs and La Mirada (from approximately Carmenita Road to the Orange County Line) that receive interstate freight delivered by the BNSF Railway. A typical at-grade configuration discussed in Section 3.6 is not feasible for this subsection because of safety issues (there cannot be at-grade railroad crossings) and potential transportation impacts. Two options are examined for this area in the following section: continuing the HST tracks to the south/west of the existing LOSSAN corridor tracks (requiring a four mile long aerial structure), or placing the HST tracks at-grade to the north/east of the existing LOSSAN corridor tracks with flyovers or undercrossings in the Norwalk / Santa Fe Springs and Buena Park station areas to connect back to the HST tracks on the south/west side of the LOSSAN corridor. An overview of the La Mirada Rail Yards area is shown in Figure 4.7-1. The options are evaluated in Table 4.7-1.

Figure 4.7-1 La Mirada Rail Yards – Overview



Source: STV Incorporated, AE LLC

June 28, 2010

California High-Speed Train Alternatives Analysis Report

Legend

0 1,250 2,500 5,000 Feet

0 375 750 1,500 Meters

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

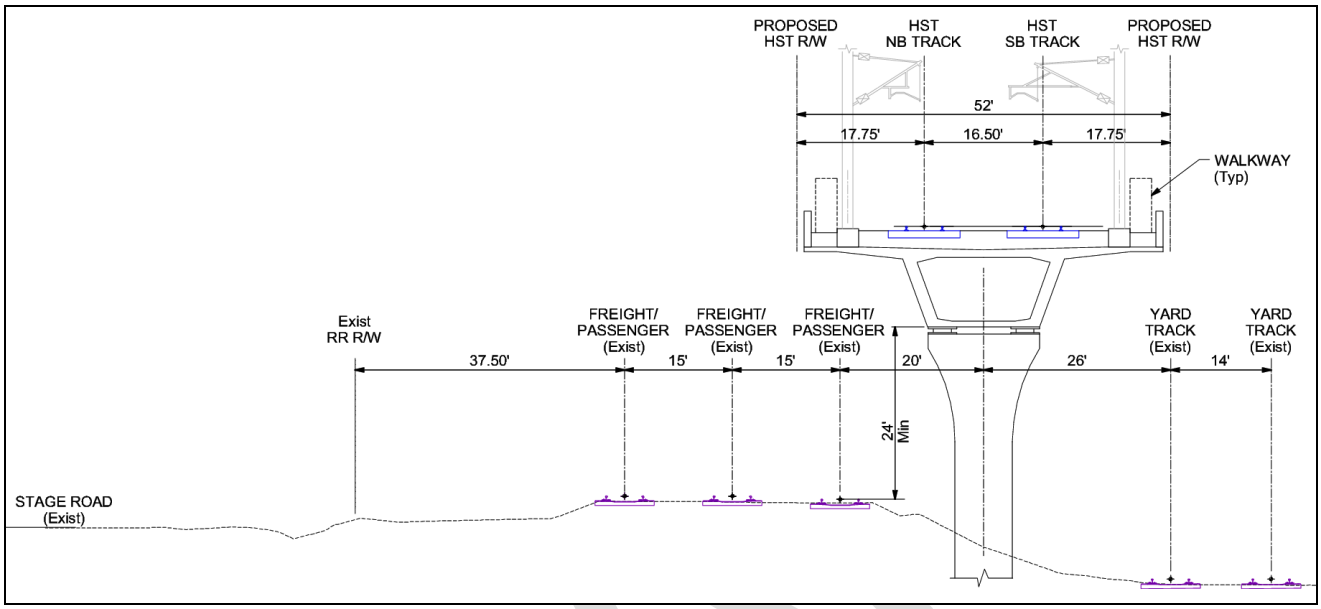
- CA Counties
- City Boundaries

La Mirada Rail Yards
Dedicated HST Alternative - Overview

4.7.1 Aerial Option

The aerial option would construct the HST tracks on an approximately 4-mile long aerial structure on the south/west side of the ROW to clear existing freight rail yards and tracks in the area. A typical cross-section for this option is shown in Figure 4.7-2.

Figure 4.7-2 Typical Cross-Section – La Mirada Rail Yards – Aerial Option

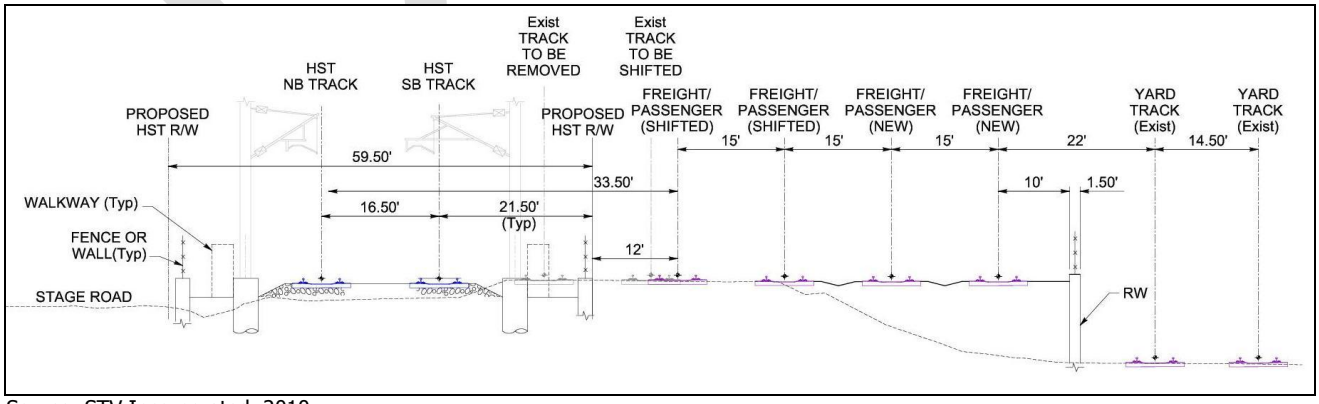


Source: STV Incorporated, 2010

4.7.2 At-Grade Option

The at-grade option would use flyovers or underpasses in the Norwalk / Santa Fe Springs and Buena Park Metrolink station areas to cross the HST tracks to the north/east side of the corridor. Stage Road is currently located north/east of the LOSSAN corridor for much of this subsection with residential properties beyond, so the ROW acquisition needs to fit the HST project into the corridor are generally concentrated on the south/west side of the LOSSAN corridor. Shifts of the existing LOSSAN corridor tracks and reconfiguration of the existing rail yards are needed in the area are needed to allow for efficient continuing railroad operations. A typical cross-section for this option is shown in Figure 4.7-3.

Figure 4.7-3 Typical Cross-Section – La Mirada Rail Yards – At-Grade Option



Source: STV Incorporated, 2010

Table 4.7-1 Evaluation Table – La Mirada Rail Yards Options

Evaluation Measure	Aerial Option	At-Grade Option
Design Objectives		
Ridership / Revenue Potential	No difference between options.	
Intermodal Connections	No stations proposed in this subsection.	
Capital Costs	Large capital costs for long aerial structure.	Lower capital costs given at-grade configuration, but extensive ROW acquisitions and railroad reconfigurations required.
Operating Costs	No difference between options.	
Operations Issues	No major operations issues.	
Land Use		
Station Area Development Potential	No stations proposed in this subsection.	
Consistency with Other Planning Efforts	No major planning efforts underway in area.	
Constructability		
Construction Access Issues	Constrained construction area between rail yards and Stage Road. Access to LOSSAN corridor via several road crossings.	
Railroad Impacts	Construction impacts to existing LOSSAN corridor tracks and freight yards under aerial structure during construction.	Requires extensive shifting of existing LOSSAN corridor tracks and reconfiguration of freight rail yards and spurs.
Utility Impacts	Several utility crossings in area. No expected difference between options.	
Neighborhood / ROW Impacts		
Displacements	Temporary displacements possibly needed during construction, otherwise structure is above existing railroad and roadway ROW.	Option would require relocating LOSSAN corridor tracks and rail yards to the south/west and acquiring some ROW to south side of corridor. Displacements would generally be the front parking areas of industrial / commercial properties.
Property Access Issues	No access issues anticipated.	Rail and auto/truck access modifications to some industrial and commercial properties on south side of ROW may be needed.
Station Area Traffic Effects	No stations proposed in this subsection.	
Grade Crossing Traffic Effects	Current at-grade crossings at Rosecrans Ave, Marquardt Ave and Valley View Ave to be grade separated as part of BNSF Third Main Track Project. No grade crossing effects anticipated.	Current at-grade crossings at Rosecrans Ave, Marquardt Ave and Valley View Ave to be grade separated as part of BNSF Third Main Track Project. Potential temporary construction impacts for all crossings when constructing new HST bridge adjacent to existing railroad bridge.
Resource Impacts		
Waterways / Sensitive Habitat Areas	Alignment crosses the North Fork of Coyote Creek, La Mirada Creek, and Coyote Creek in this area (all are concrete channels).	
Cultural Resources	No cultural resources impacts expected in area, as most development adjacent to corridor is industrial or SF residential.	
Parklands	Recreational trail adjacent to the North Fork of Coyote Creek may be affected by project.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	

Evaluation Measure	Aerial Option	At-Grade Option
Environmental Impacts		
Noise / Vibration	An aerial structure would potential have noise impacts to residential community north of the LOSSAN corridor between Valley View Ave and the Orange County Line.	Residential community north of LOSSAN corridor between Valley View Ave and the Orange County Line may be affected by option.
Visual / Scenic Resources	An aerial structure would be highly visible to the residential community north of the LOSSAN corridor between Valley View Ave and the Orange County Line.	Residential community north of LOSSAN corridor between Valley View Ave and the Orange County Line may be affected by option.
Geologic / Soil Constraints	There are no known geologic or soils constraints within this area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

4.7.3 Conclusions

The aerial option would require fewer modifications to existing railroad operations in the area, but could have large community impacts to the residential community to the north of the corridor (including noise and visual impacts). The at-grade option has a smaller footprint in the community, but requires extensive reconfiguration of the existing railroad operations in the area to fit the HST tracks into the corridor.

Given its potential for noise and visual impacts to residential communities north of the LOSSAN corridor in this area, it's recommended that the Aerial Option be eliminated from further consideration and the At-Grade Option be analyzed further in the Draft EIR/EIS.

4.7.4 Options Eliminated / Carried Forward

Options to be eliminated from further consideration:

- **Aerial Option**

Options to be carried forward:

- **At-Grade Option**

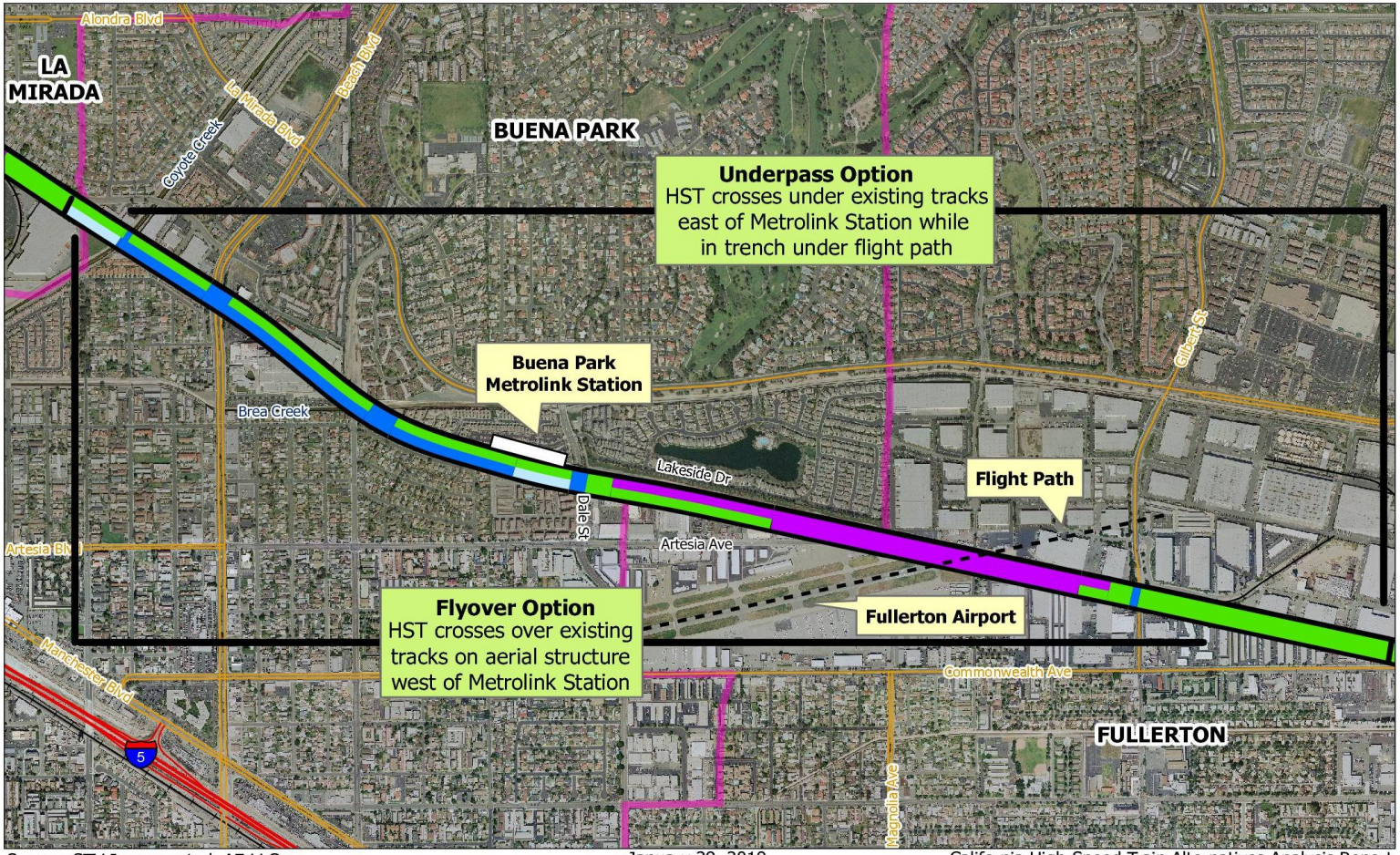
4.8 BUENA PARK / FULLERTON AIRPORT

Sections 4.5 and 4.6 in 2009 Draft AA Report replaced as follows:

The newest Metrolink Station in Orange County is located in Buena Park just west of Dale Street. This station includes an at-grade parking lot to the north of two station platforms, three main tracks through the station, and a pedestrian bridge over the tracks. The platforms and pedestrian crossing can be modified to accommodate four tracks through the station in the future. New housing developments to the north and south of the station are built very close to the ROW, making any future at-grade expansion of the station difficult.

With the at-grade option selected for the La Mirada Rail Yards area in Section 4.7, a flyover or underpass is needed in the Buena Park area to return the HST tracks to the south/west side of the LOSSAN corridor. In addition, the flight path of the Fullerton Airport near the Buena Park / Fullerton boundary crosses directly over the LOSSAN corridor and requires HST tracks to be in a trench to not interfere with airport operations. Two options are examined in the Buena Park / Fullerton Airport area: an aerial flyover options and a trench underpass option (which was developed after further consultation with area stakeholders). The Buena Park / Fullerton Airport area is illustrated in Figure 4.8-1. The options are evaluated in Table 4.8-1.

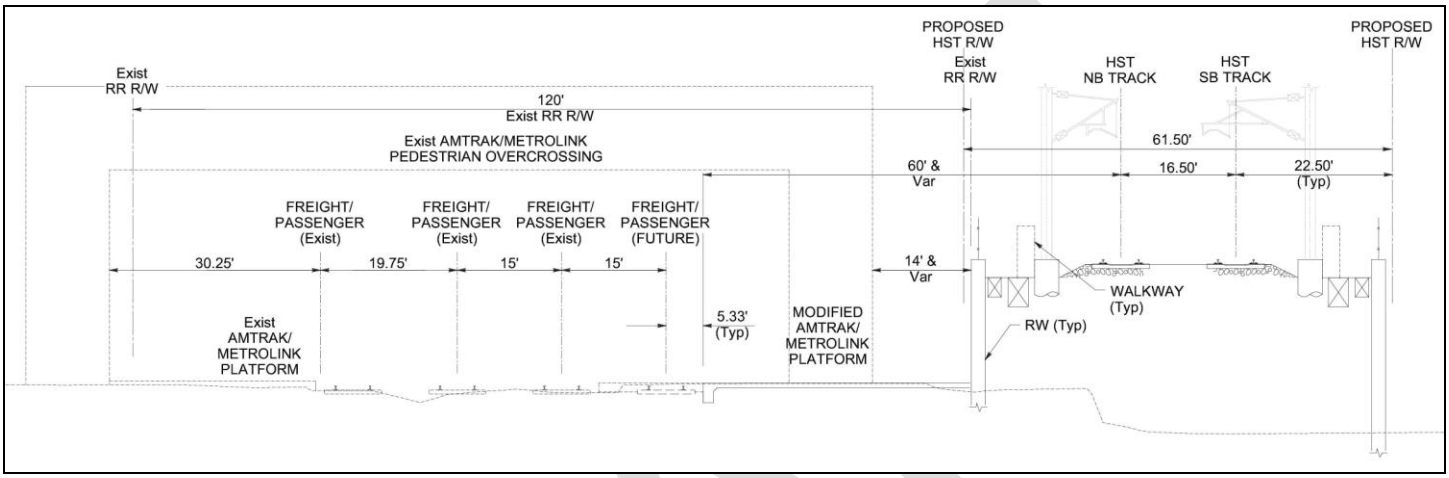
Figure 4.8-1 Buena Park / Fullerton Airport – Overview



4.8.1 Flyover Option

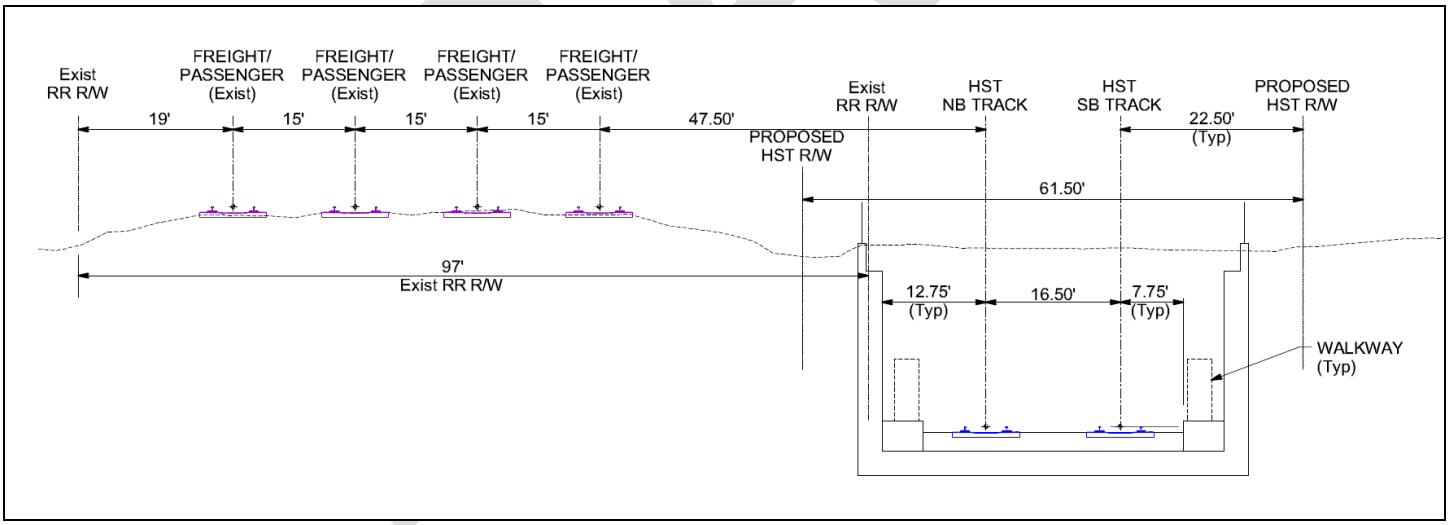
One option to cross the HST tracks back to the south/west side of the corridor is a flyover in the area between the Orange County Line and Buena Park Metrolink Station. There are residential uses on both sides of the corridor in the area, and the option would return to grade by approximately Dale Street. A typical cross section for the option at the Buena Park Metrolink Station is shown in Figure 4.8-2. At the Fullerton Airport, the option descends into a trench to provide clearance for the runway's flight path, as shown in Figure 4.8-3

Figure 4.8-2 Typical Cross-Section – Buena Park Metrolink Station – Flyover Option



Source: STV Incorporated, 2010

Figure 4.8-3 Typical Cross-Section – Fullerton Airport Trench

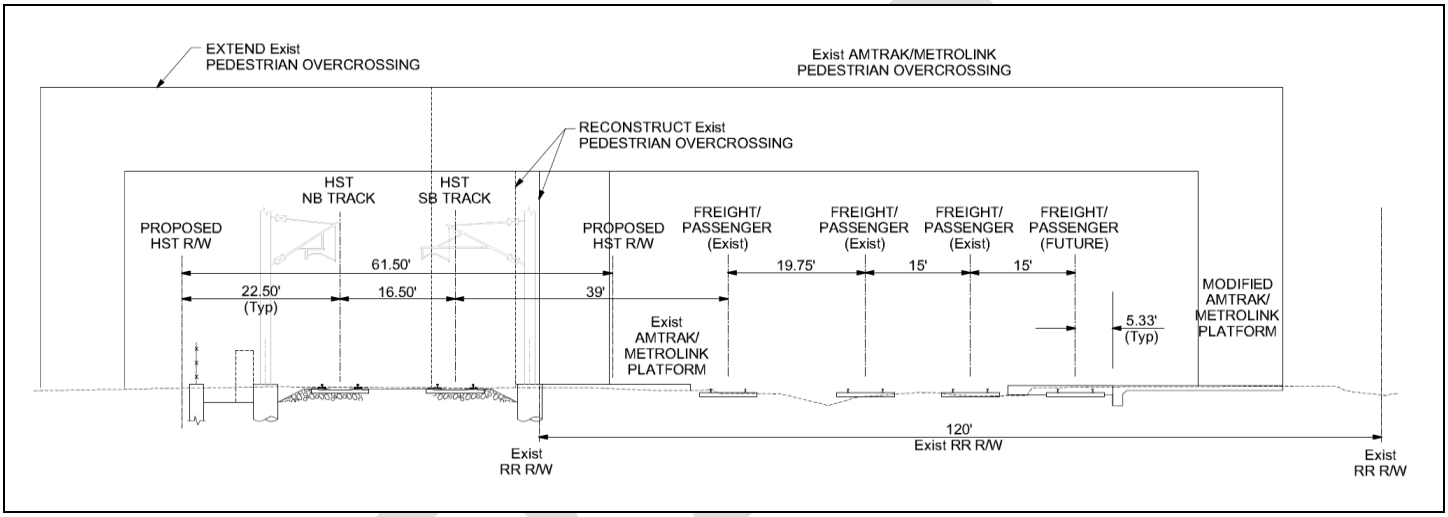


Source: STV Incorporated, 2010

4.8.2 Underpass Option

A second option is to use the change in grade needed to clear under the Fullerton Airport flight path to also cross underneath the LOSSAN corridor, eliminating the need for a flyover to the west of the Buena Park Metrolink Station. For this option, the HST tracks would continue at-grade on the north/east side of the LOSSAN corridor through Buena Park, transitioning into a trench and underpass between Dale Street and Gilbert Street. This option would require the reconstruction of portions of the Buena Park Metrolink Station, and possibly modifications to the Dale Street and Gilbert Street grade separations. A typical cross section for this option through the Buena Park Metrolink Station is shown in Figure 4.8-4. The option would have a nearly-identical cross-section past Fullerton as the other option (and shown in Figure 4.8-3

Figure 4.8-4 Typical Cross-Section – Buena Park Metrolink Station – Underpass Option



Source: STV Incorporated, 2010

Table 4.8-1 Evaluation Table – Buena Park / Fullerton Airport Options

Evaluation Measure	Flyover Option	Underpass Option
Design Objectives		
Ridership / Revenue Potential	No difference between options.	
Intermodal Connections	Option would require reconfiguration of Buena Park Metrolink Station's pedestrian connection to south.	Option would require reconfigurations of Buena Park Metrolink Station's parking area and pedestrian connection between parking / buses and platforms.
Capital Costs	Requires a costly aerial structure and residential property acquisitions to south of corridor.	At-grade alignment is less costly than an aerial structure. Requires fewer residential property acquisitions than Flyover Option. Requires extensive reconfiguration of Buena Park Metrolink Station.
Operating Costs	No difference between options.	
Operations Issues	No major operations issues.	
Land Use		
Station Area Development Potential	No HST stations proposed in this subsection.	
Consistency with Other Planning Efforts	No inconsistencies with other planning efforts.	
Constructability		
Construction Access Issues	Constrained construction area between residential areas on both sides of LOSSAN corridor. Access to LOSSAN corridor via several road crossings.	
Railroad Impacts	Construction of flyover structure will have temporary impacts on railroad operations though area.	Construction of underpass structure will have temporary impacts on railroad operations though area.
Utility Impacts	Several utility crossings in area. No expected difference between options.	
Neighborhood / ROW Impacts		
Displacements	Acquisition of several SF and MF residential units to south of corridor.	Would need to acquire minimal MF residential unit property, but also would require acquisition of section of existing Buena Park Metrolink Station.
Property Access Issues	HST tracks may require minor property access changes in vicinity of Beach Blvd, Dale St and Gilbert St crossings.	
Station Area Traffic Effects	No HST stations are proposed at this subsection location.	
Grade Crossing Traffic Effects	Potential temporary construction impacts for all crossings when constructing new HST bridge adjacent to existing railroad bridge.	Current grade separations at Dale Street and Gilbert Street may need to be modified to add HST tracks. Potential temporary construction impacts for all crossings when constructing new HST bridge adjacent to existing railroad bridge.
Resource Impacts		
Waterways / Sensitive Habitat Areas	Alignment crosses Coyote Creek and Brea Creek in this area (all are concrete channels).	
Cultural Resources	There are no known cultural resources within this area that would be affected.	
Parklands	There are no parklands within this area that would be affected.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	
Environmental Impacts		
Noise / Vibration	Residential neighborhoods to north and south of ROW may be affected by HST aerial structure noise and vibration impacts.	Residential neighborhoods to north and south of ROW may be affected by HST noise and vibration impacts.
Visual / Scenic Resources	Residential neighborhoods to north and south of ROW may be affected by HST aerial structure visual impacts.	Residential neighborhoods to north and south of ROW may be affected by HST visual impacts.
Geologic / Soil Constraints	There are no known geologic or soils constraints within this area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

4.8.3 Conclusions

The Flyover Option is costly and would require extensive residential ROW acquisition along the south side of the LOSSAN corridor along with potential visual and noise impacts to surrounding residential properties. The Underpass Option would likely have fewer impacts to surrounding residential communities than the Flyover Option, but would require relocation of the Buena Park Metrolink Station to either Dale Street or Beach Boulevard.

Given its potential for noise, visual and property impacts to residential communities north and south of the LOSSAN corridor in this area, it's recommended that the Flyover Option be eliminated from further consideration and the Underpass Option be analyzed further in the Draft EIR/EIS. This is a change from the Draft AA Report, which recommended the Flyover Option be carried forward, and has occurred in response to further analysis of project impacts and consultation with stakeholders in the area.

4.8.4 Options Eliminated / Carried Forward

Options to be eliminated from further consideration:

- **Flyover Option**

Options to be carried forward:

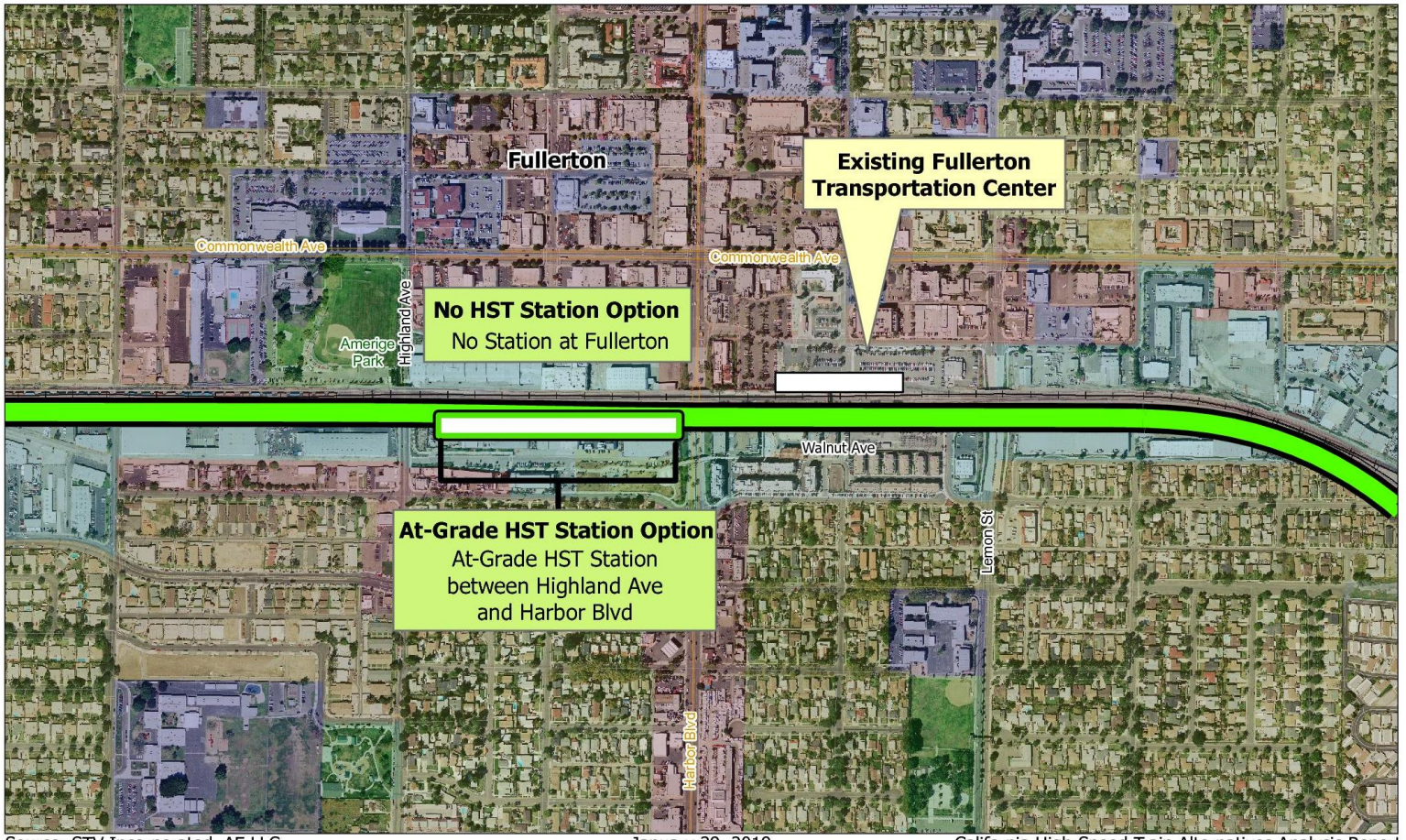
- **Underpass Option**

4.9 FULLERTON STATION

Same as Section 4.4 in 2009 Draft AA Report with modifications as follows:

There are two options that are explored in the Fullerton Station area: at-grade without an HST station and at-grade with an HST station. The Fullerton HST Station design required four tracks when the Draft AA Report was completed. Because of changes in design and operating criteria, all trains will stop in Fullerton or Norwalk / Santa Fe Springs and only two station tracks are now required. The four track aerial and tunnel HST station options examined in the Draft AA Report have been eliminated from consideration in this report given the ability to accommodate the Fullerton HST Station at-grade with only a slightly larger track and platform footprint than the Fullerton No HST Station Option.

Figure 4.9-1 Fullerton Station – Overview



4.9.1 No HST Station Option

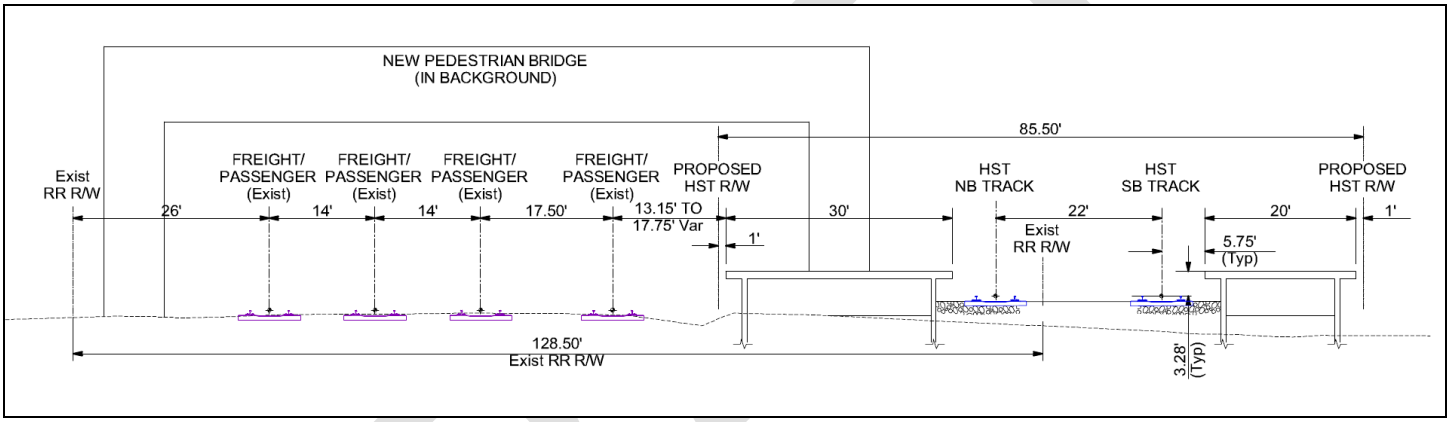
Same as Section 4.4.1 in 2009 Draft AA Report

4.9.2 At-Grade HST Station Option

Section 4.4.2 in 2009 Draft AA Report replaced as follows:

The other option is to construct an at-grade HST station in Fullerton. To simplify intermodal connections, the best location for the new HST station would be as close to the existing Metrolink/Amtrak station as possible. Because the existing station is located in a constrained area and there is little room to expand to the south, the at-grade HST station would be located immediately to the west of the existing station between Highland Ave and Harbor Blvd. The HST station would have one platform for two HST tracks, and is illustrated in Figure 4.9-2.

Figure 4.9-2 Typical Cross-Section – Fullerton Station – HST Station Option



Source: STV Incorporated, 2010

4.9.3 Evaluation Table

Evaluation Table 4.4.4 in 2009 Draft AA Report replaced with Table 4.9-1

Table 4.9-1 Evaluation Table – Fullerton Station Options

Evaluation Measure	No HST Station Option	At-Grade HST Station Option
Design Objectives		
Ridership / Revenue Potential	No riders can access HST system at Fullerton. Access would be provided in Anaheim, 5 miles to the south.	Fullerton HST station serves northern Orange County, southern Los Angeles County, western Riverside and San Bernardino counties.
Intermodal Connections	Option would require reconfiguration of FTC's pedestrian connection to south.	FTC allows for transfers between HST, Metrolink, Amtrak, and buses. Option would require reconfiguration of FTC's pedestrian connection across LOSSAN corridor.
Capital Costs	At-grade construction without HST station minimizes costs in area.	At-grade HST station is more expensive to build than no-station option.
Operating Costs	At-grade construction without HST station minimizes costs in area.	At-grade HST station is more expensive to operate than no-station option.
Operations Issues	Potential staging issues with Fullerton Turnback Facility.	HST stations at Anaheim and Fullerton would be very close and limit HST speeds through area. The existing sharp curve just east of Fullerton station would remain, limiting operational speeds through this area to 60 mph (97 kph).

Evaluation Measure	No HST Station Option	At-Grade HST Station Option
Land Use		
Station Area Development Potential	Fullerton is already site of major TOD activity, but new development would lack direct access to HST.	HST station would enhance existing TOD plans in area.
Consistency with Other Planning Efforts	Enhanced Transportation Center is consistent with the City of Fullerton's Framework Plan, which identifies infrastructure improvements needed to support future redevelopment goals.	
Constructability		
Construction Access Issues	Access to LOSSAN corridor via several road crossings and FTC.	
Railroad Impacts	Requires modifications to Fullerton Turnback Facility which is currently under construction on south side of LOSSAN corridor.	Will introduce temporary impacts to south side of existing station during construction, and modifications to Fullerton Turnback Facility.
Utility Impacts	Several utility crossings in area. No expected difference between options.	
Neighborhood / ROW		
Displacements	Majority of HST footprint can be accommodated between existing tracks and Walnut Street in existing parking areas and public space.	Will require the acquisition of existing industrial uses on both the north and south side of the tracks between Highland Ave and Harbor Blvd.
Property Access Issues	Require modifications to Walnut Street, possibly modifying access for residential and commercial uses within FTC area.	
Station Area Traffic Effects	There is little potential for additional traffic impacts from the addition of HST tracks.	Would introduce large numbers of new riders in autos and buses to FTC station area.
Grade Crossing Traffic Effects	Potential temporary construction impacts for area crossings when constructing new HST bridge adjacent to existing railroad bridge.	
Resource Impacts		
Waterways / Sensitive Habitat Areas	There are no waterways or sensitive habitats within this area that would be affected.	
Cultural Resources	Potential exists for the addition of HST tracks to impact cultural resources within the historic depot station area.	The addition of a new station within close proximity to the historic depot building could result in potential impacts to cultural resources.
Parklands	Amerige Park is located directly north of the LOSSAN corridor and west of Highland Ave. A recreational trail is located south of and parallel to the LOSSAN corridor in the area.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	
Environmental Impacts		
Noise / Vibration	There is a potential for construction and operational noise and vibration impacts to adjacent commercial, residential, and historic buildings.	
Visual / Scenic Resources	Installing HST tracks through the Fullerton Station area would alter the appearance of the existing station.	An at-grade station would have a potential impact on the visual / scenic resources in adjoining residential and historic station areas by blocking views and creating shadows. The HST Station itself would be designed to fit into the architectural theme in the Fullerton Station area.
Geologic / Soil Constraints	There are no known geologic or soils constraints within the Fullerton Station area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

4.9.4 Conclusions

Section 4.4.5 in 2009 Draft AA Report replaced as follows:

The No HST Station Option has lower costs and environmental impacts than the At-Grade HST Station Option, but does not provide for HST service at Fullerton, currently the busiest rail station in Orange County. The At-Grade HST Station Option does provide service at Fullerton and opportunities to transfer between HST, Metrolink, Amtrak and local buses, but has the potential for more impacts to the surrounding community than the No HST Station Option. These potential impacts include property acquisitions and potential visual and noise impacts.

Both options should be carried forward for further examination in the Draft EIR/EIS, with a focus on comparing the Fullerton HST station options to the Norwalk / Santa Fe Springs station options discussed in Section 4.6. The Draft AA Report recommended an aerial HST option be carried forward, but this recommendation has been changed to At-Grade HST Station Option in response to changes in HST design criteria and further consultation with stakeholders in the area.

4.9.5 Options to be Carried Forward

Section 4.4.6 in 2009 Draft AA Report replaced as follows:

- **No HST Station Option**
- **At-Grade HST Station Option**

4.10 ANAHEIM

Same as Section 4.3 in 2009 Draft AA Report

4.11 ARTIC

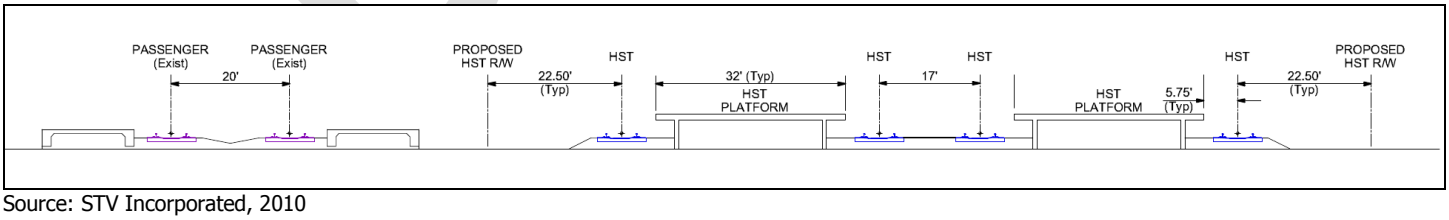
Section 4.2 in 2009 Draft AA Report replaced as follows:

The southern terminus of the LA-A HST project is located at the Anaheim Regional Transportation Intermodal Center (ARTIC), a transit facility currently being planned by the City of Anaheim and OCTA (see Section 3.3.8 for more detail). There are three potential HST station designs being considered for ARTIC. Two are at-grade, with one extending underneath the SR-57 freeway and the other lying to the west. A third option is to have the station underground and extending under SR-57. The options are evaluated in Table 4.11-1. The ARTIC area and station options are shown in the lower right of Figure 4.11-3. The West At-Grade HST Station Option and Underground HST Station Option were developed after further design activities and coordination with stakeholders in the area.

4.11.1 East At-Grade HST Station Option

The eastern at-grade station option includes seven tracks and four platforms configured as follows: four HST tracks served by two platforms; and three Metrolink/Amtrak tracks served by two platforms (the third track is not currently necessary, but may be built in the future). The tracks and platforms extend underneath the SR-57 freeway underpass, and would require extensive reconstruction of the roadway structure to fit the HST tracks and platforms. A typical cross-section for this option is provided in Figure 4.11-1.

Figure 4.11-1 Typical Cross-Section – ARTIC – At-Grade HST Station Options



Source: STV Incorporated, 2010

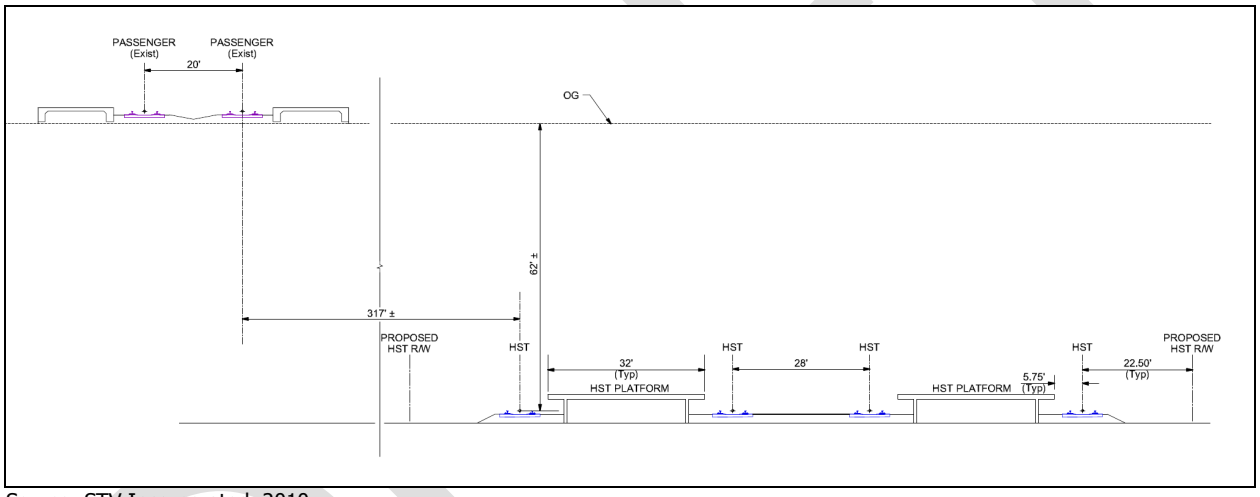
4.11.2 West At-Grade HST Station Option

The west at-grade station option is very similar to the east at-grade option, but does not extend underneath the SR-57 freeway. Instead, the platforms are located approximately 1000' (305 meters) to the west and the tracks end before reaching the freeway structure. Longer connections will be required to reach the main ARTIC station facilities. A design that examined shifting the ARTIC station facilities to the west as well was briefly investigated but ultimately rejected based on development and ROW issues. The typical cross-section for this option is identical to the east at-grade option, as shown in Figure 4.11-1.

4.11.3 Underground HST Station Option

The underground HST station option includes four HST tracks and two platforms located under the Angel Stadium parking lot and SR-57 freeway to reduce impacts to the SR-57 freeway structure. An HST waiting area would be located at-grade and connect the underground HST tracks to the Amtrak/Metrolink tracks and station facilities, which will remain at-grade. A typical cross-section for the option is shown in Figure 4.11-2. It could connect to either the Deep Tunnel or At-Grade Options to the north in Anaheim.

Figure 4.11-2 Typical Cross-Section – ARTIC – Underground HST Station Option



Source: STV Incorporated, 2010

Figure 4.11-3 Anaheim – Overview

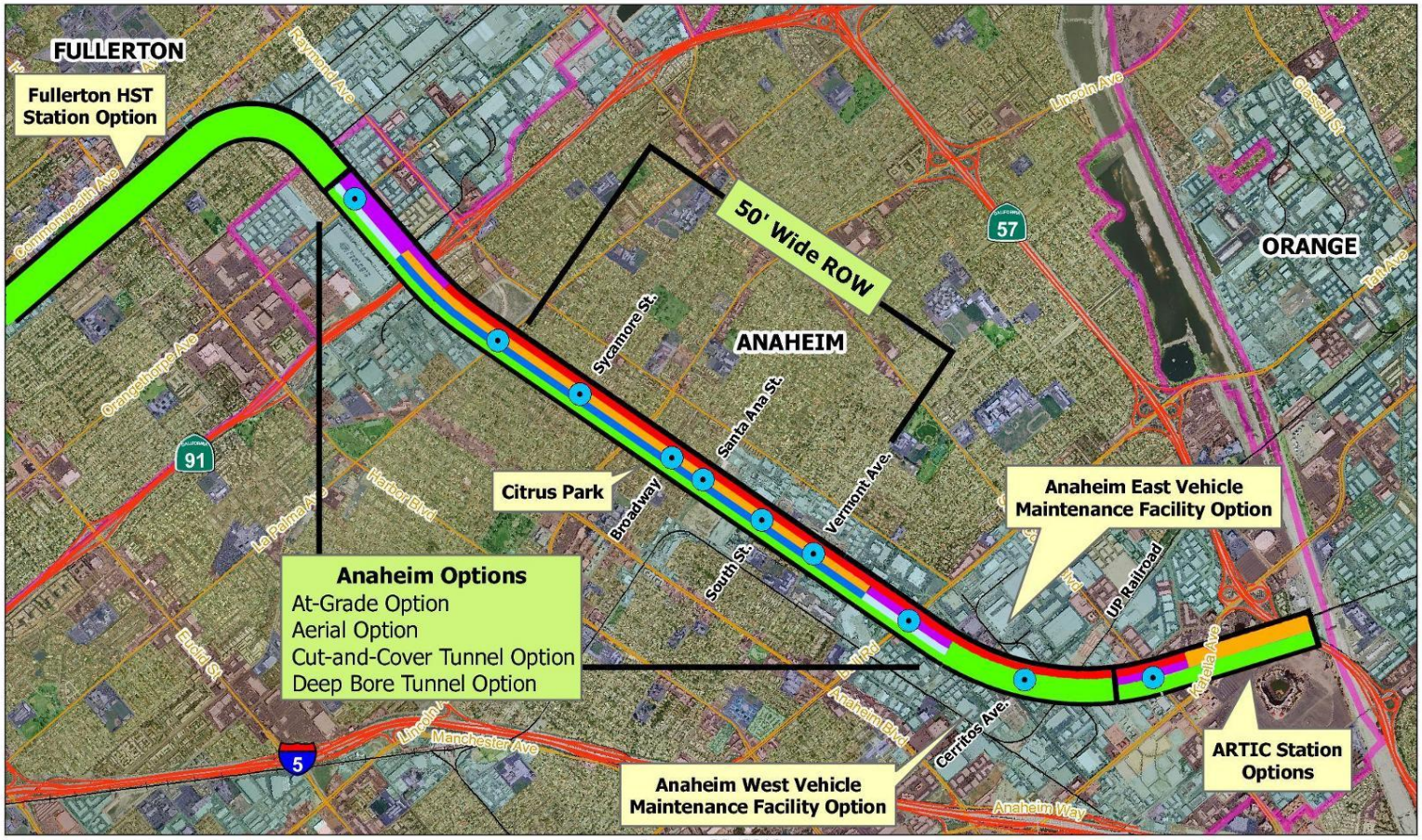


Table 4.11-1 Evaluation Table – ARTIC Options

Evaluation Measure	East At-Grade HST Station Option	West At-Grade HST Station Option	Underground HST Station Option
Design Objectives			
Ridership / Revenue Potential	All station options have similar ridership potential, and would serve Orange County and points south and east.		
Intermodal Connections	HST tracks and platforms directly adjacent to Metrolink/Amtrak platforms.	HST tracks and platforms approximately 1000' feet (305 meters) to west of Metrolink/Amtrak platforms and main station facilities.	Amtrak / Metrolink platforms and station facilities will be one level above HST platforms and to north.
Capital Costs	At-Grade construction less expensive than underground, but large costs to rebuild SR-57 underpasses.	Least expensive station option.	Underground station facilities will be most expensive to construct, but will not require extensive reconstruction of SR-57 overpass.
Operating Costs	Similar operating costs at-grade, less expensive than underground option.		Additional operating / maintenance costs for underground station as compared to at-grade and options due to ventilation, lighting, emergency access / egress, monitoring of operations, and other operating activities.
Operations Issues	No major operations issues foreseen.		
Land Use			
Station Area Development Potential	All HST station options would allow for redevelopment of surrounding area, as is currently planned as part of ARTIC project and City of Anaheim's Platinum Triangle initiative.		
Consistency with Other Planning Efforts			
Constructability			
Construction Access Issues	Would require complete reconstruction of SR-57 overpass over LOSSAN corridor, which carries large volumes of traffic that would be difficult to detour. Existing station, Angel Stadium parking lot and road crossings provide access for construction activities in area.	Existing station, Angel Stadium parking lot and road crossings provide access for construction activities in area.	
Railroad Impacts	All options would construct the HST station south of the existing LOSSAN corridor tracks, with likely only minimal impacts to existing rail operations.		
Utility Impacts	Several utility crossings in area. No expected difference between options.		

Evaluation Measure	East At-Grade HST Station Option	West At-Grade HST Station Option	Underground HST Station Option
Neighborhood / ROW Impacts			
Displacements	At-grade options would require acquisition of commercial properties south of existing LOSSAN corridor, including Angel Stadium parking lot.		Underground option would require temporary acquisition of commercial properties south of existing LOSSAN corridor, including Angel Stadium parking lot during construction. After construction, new development could be built on top of station.
Property Access Issues	HST tracks may require minor property access changes in vicinity of existing grade crossings.		
Station Area Traffic Effects	Construction and operation of a HST station would induce large numbers of new auto and transit trips in the ARTIC station area.		
Grade Crossing Traffic Effects	Potential temporary construction impacts for all current crossings when constructing new HST bridge adjacent to existing railroad bridge.		
Resource Impacts			
Waterways / Sensitive Habitat Areas	The LOSSAN corridor crosses the Santa Ana River to the east of ARTIC. There are no known sensitive habitats within this area that would be affected.		
Cultural Resources	There are no known cultural resources within this area that would be affected.		Underground HST tracks and platforms could have the potential to affect buried archaeological resources.
Parklands	A recreational trail runs along the Santa Ana River to the east of ARTIC.		
Agricultural Lands	There are no agricultural lands within this area that would be affected.		
Environmental Impacts			
Noise / Vibration	Area surrounding station is generally commercial and will likely not be affected by noise and vibration impacts from HST project. Potential noise and vibration impacts from increased auto traffic accessing station.		Underground option will likely not have noticeable noise or vibration signature at grade. Potential noise and vibration impacts from increased auto traffic accessing station.
Visual / Scenic Resources	Area surrounding station is generally commercial. HST station will integrate with ARTIC design currently being advanced by City of Anaheim / OCTA.		Underground station will only be minimally visible on at surface.
Geologic / Soil Constraints	There are no known geologic or soils constraints within the area.		
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.		

4.11.4 Conclusions

The two at-grade HST station options are similar in most respects, but differ in their intermodal connections and construction impacts. The east option provides the best connection to Metrolink/Amtrak and the planned ARTIC facilities, but requires the reconstruction of the SR-57 overpass. This reconstruction would be expensive and extremely disruption to traffic flow in the area. The west option does not affect the SR-57 overpass, but requires longer connections for passengers to the ARTIC facilities and existing rail service. The underground option has higher costs but fewer impacts at the surface, and allows for the reuse of the station footprint once construction is completed.

The East At-Grade HST Station Option is proposed for elimination based on its constructability issues. Although it was proposed to be carried forward in the Draft AA Report, further investigation has shown that it is not feasible to construct without major traffic impacts. The West At-Grade HST Station Option and Underground HST Station Option are proposed to be carried forward for full analysis in the Draft EIR/EIS, with a focus on the intermodal connectivity of the at-grade option and the design of the underground option under the SR-57 freeway.

4.11.5 Options Eliminated / Carried Forward

Option to be eliminated from further consideration:

- **East At-Grade HST Station Option**

Options to be carried forward:

- **West At-Grade HST Station Option**
- **Underground HST Station Option**

5.0 Definition / Evaluation of Subsection Options – Consolidated Shared-Track Alternative

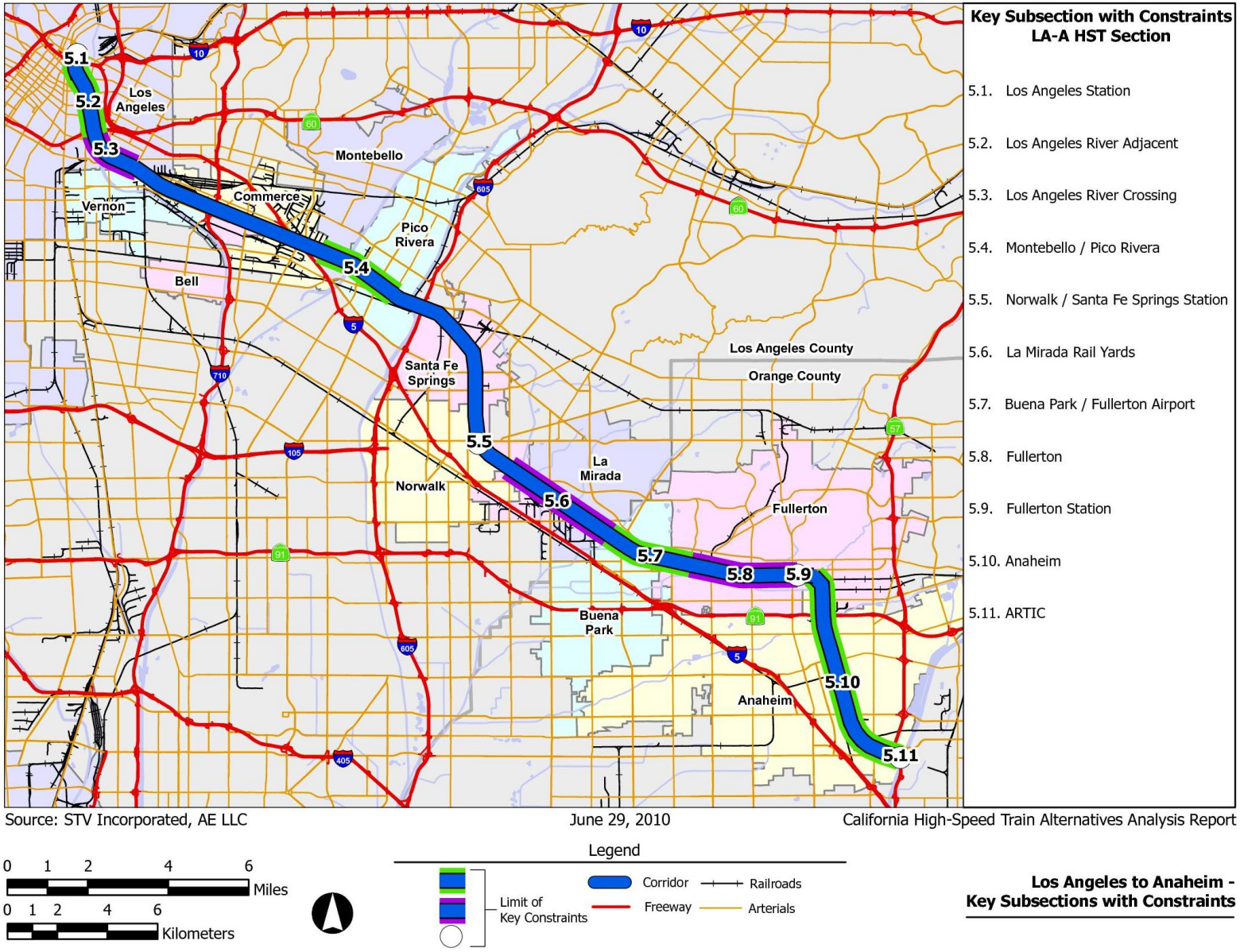
Section not included in 2009 Draft AA Report and added as follows:

This section focuses on further defining individual subsections of the Consolidated Shared-Track HST Alternative. These key subsections have non-typical configurations or several design options to address key constraints. They are shown in Figure 4.11-1 and described and evaluated in the following sections. All other subsections of the Consolidated Shared-Track HST Alternative between Los Angeles and Anaheim utilize the typical aerial configuration as discussed in Section 3.7.

Report Section	LA-A Subsection with Design Options
5.1	Los Angeles Station
5.2	Los Angeles River Adjacent
5.3	Los Angeles River Crossing
5.4	Montebello / Pico Rivera
5.5	Norwalk / Santa Fe Springs Station
5.6	La Mirada Rail Yards
5.7	Buena Park / Fullerton Airport
5.8	Fullerton
5.9	Fullerton Station
5.10	Anaheim
5.11	ARTIC

Fewer options are examined for the Consolidated Shared-Track Alternative compared to the Dedicated HST Alternative. This is because the physical design of the project, existing conditions, potential environmental impacts and other major issues discussed in Section 4.0 are very similar for the two alternatives. Generally, only operational issues differ between the two alternatives. The configuration of the Consolidated Shared-Track Alternative at many key constraint locations is nearly identical to the recommended configuration of the Dedicated HST Alternative, and only differs as noted in this section.

Figure 4.11-1 Los Angeles to Anaheim – Key Subsections with Constraints



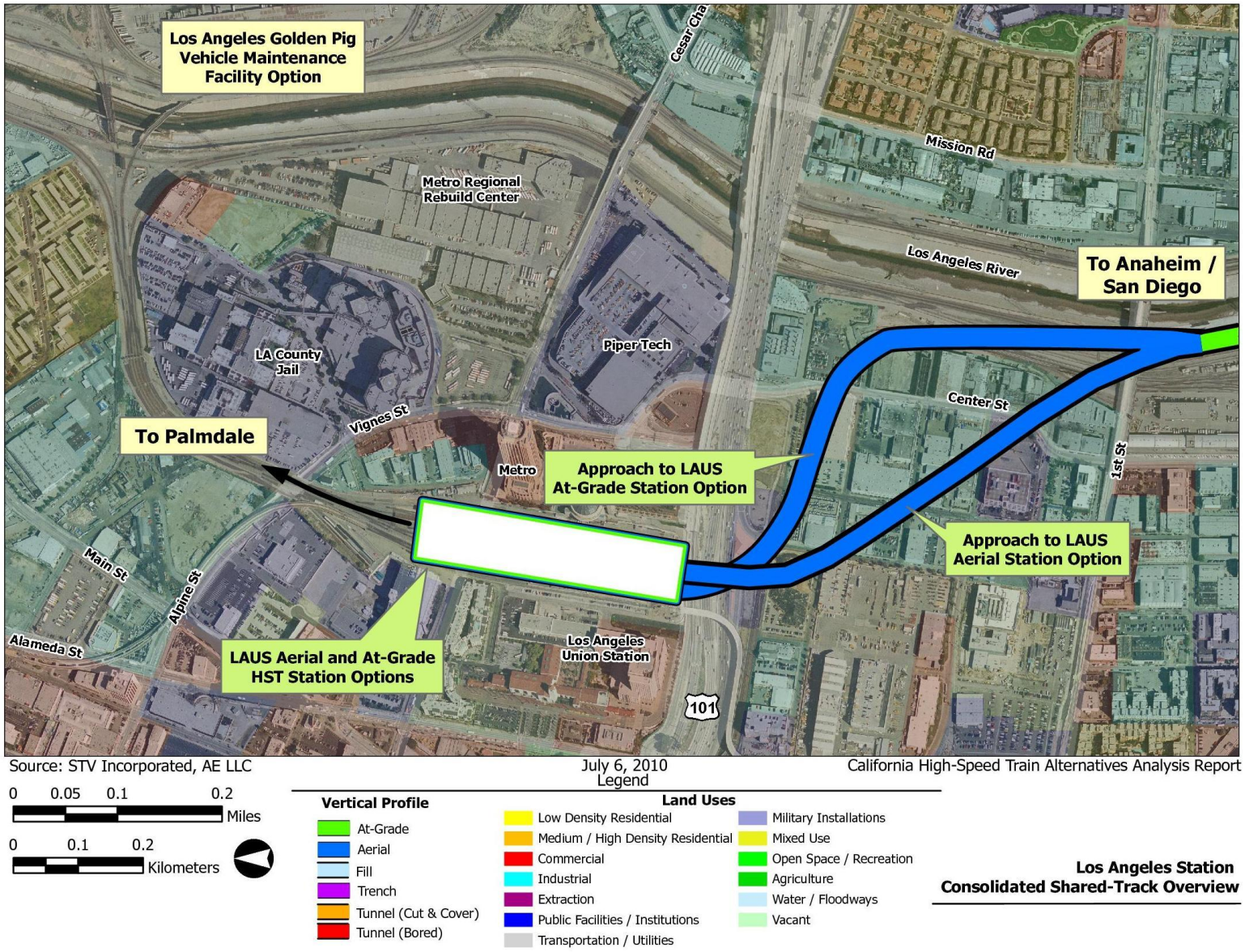
5.1 LOS ANGELES STATION

The Consolidated Shared-Track Alternative has a similar configuration to the Dedicated HST Alternative in the Los Angeles Station area, as both require dedicated HST tracks to provide sufficient capacity for the Los Angeles to Anaheim section as well as the future Los Angeles to San Diego section. The two options carried forward for the Dedicated HST Alternative at the Los Angeles Station (LAUS Aerial and LAUS At-Grade HST Stations) are also carried forward for the Consolidated Shared-Track Alternative. See Section 4.1 for further discussion of the configuration of the two options. An overview of the Los Angeles Station options for the Consolidated Shared-Track Alternative is shown in Figure 5.1-1.

5.1.1 Options to be Carried Forward

- **LAUS At-Grade HST Station Option**
- **LAUS Aerial HST Station Option**

Figure 5.1-1 Los Angeles Station – Overview



5.2 LOS ANGELES RIVER ADJACENT

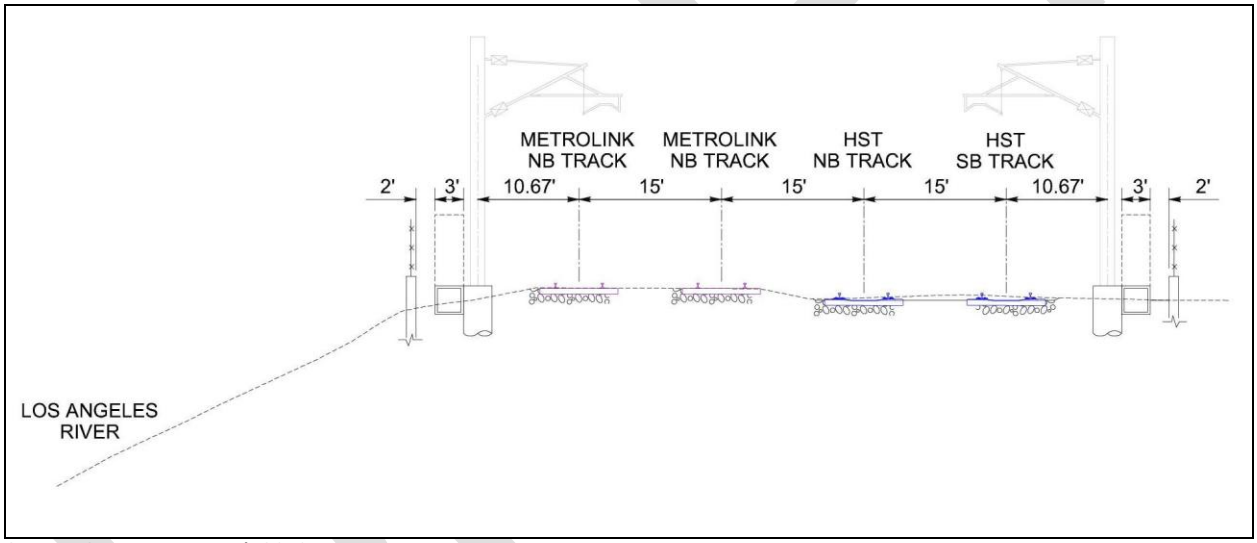
South of LAUS, the HST alignment follows the LOSSAN corridor along the west side of the Los Angeles River. Two additional tracks must be added to this section to accommodate HST trains headed from Los Angeles to both Anaheim and a future segment to San Diego via the Inland Empire. The Consolidated Shared-Track Alternative would have tracks mainly at-grade, with a below-grade section needed between Sixth Street and Interstate 10 to allow for access into the Amtrak 8th Street Yard. As will be discussed further in Section 6.3, the entrance to the existing 8th Street Amtrak facility is only accessible from the western most tracks of the LOSSAN Corridor.

A typical cross-section of the at-grade portion of this alignment is shown in Figure 5.2-1 and an overview of the Los Angeles River Adjacent area is provided in Figure 5.2-2.

5.2.1 Option to be Carried Forward

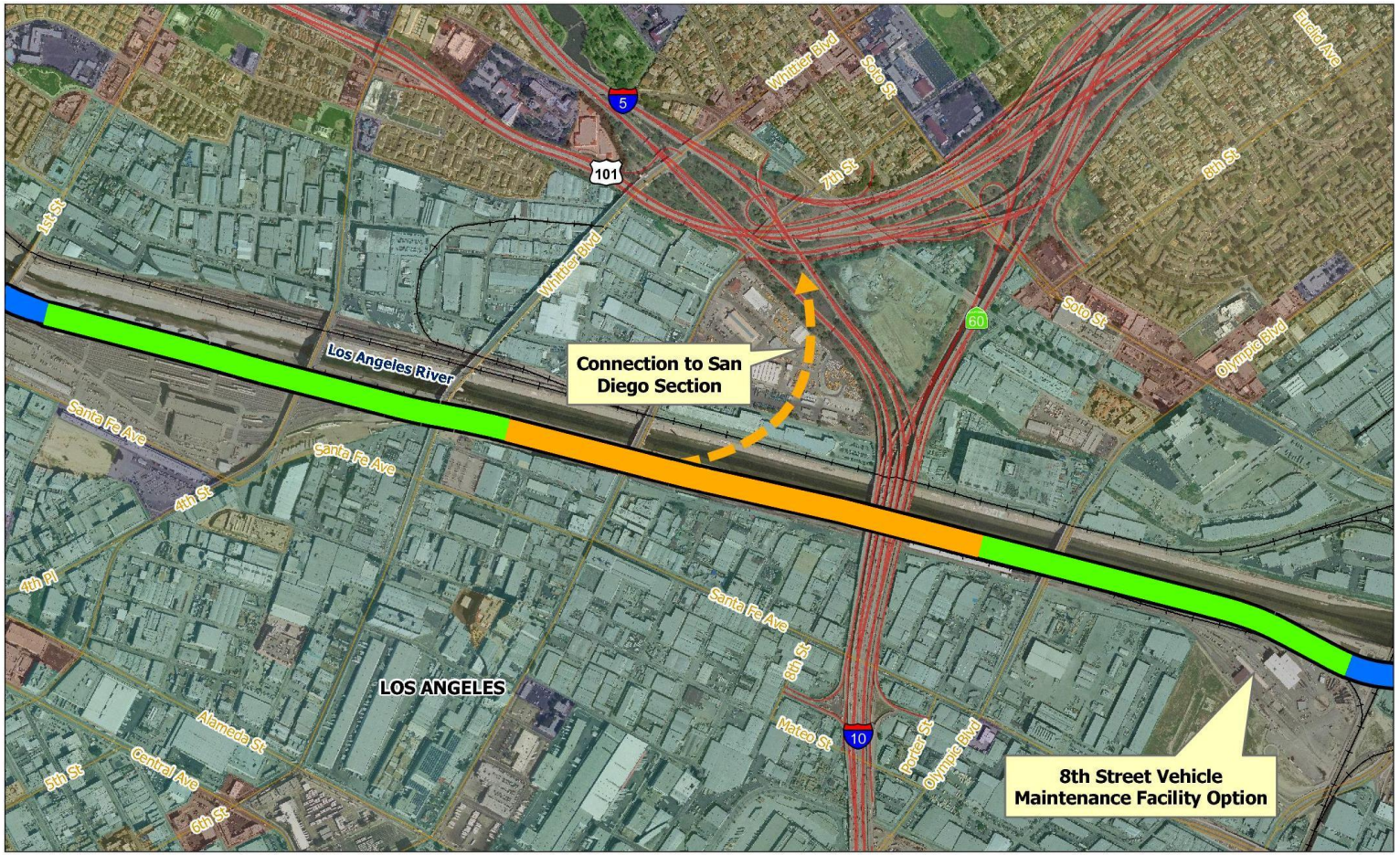
- **At-Grade/Cut-and-Cover Option**

Figure 5.2-1 Typical Cross Section – Los Angeles River Adjacent – At-Grade/Cut-and-Cover Option



Source: STV Incorporated, 2010

Figure 5.2-2 Los Angeles River Adjacent – Overview



Source: STV Incorporated, AE LLC

July 6, 2010

California High-Speed Train Alternatives Analysis Report

0 0.1 0.2 0.4 Miles

0 0.125 0.25 0.5 Kilometers

Legend

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

Los Angeles River Adjacent
Consolidated Shared-Track - Overview

5.3 LOS ANGELES RIVER CROSSING

The LOSSAN corridor turns to the southeast to cross the Los Angeles River and join the BNSF San Bernardino Subdivision in the Redondo Junction area. The HST tracks will utilize the existing Redondo Flyover currently used by Metrolink, Amtrak and freight trains due to a number of physical constraints in the area between I-10 and the Redondo Flyover. Metrolink trains will be relocated to a newly constructed flyover bridge just to the north of the current bridge to ensure reliable operations heading into LAUS. In addition, a junction for a future section of the HST project to San Diego would be located in the area just to the north or east of the Los Angeles River crossing.

The Draft AA included alternative alignments to the LOSSAN corridor (the Union Pacific and Washington Boulevard corridors) in the area east of the Los Angeles River to accommodate the junction with the Los Angeles to San Diego section of the HST project. Subsequent evolution of the LA to San Diego Project has allowed the junction with the Los Angeles to San Diego HST section to be located closer to LAUS in the vicinity of the LOSSAN corridor, and these other two options have been removed from consideration to improve operating speeds and the project footprint in the area.

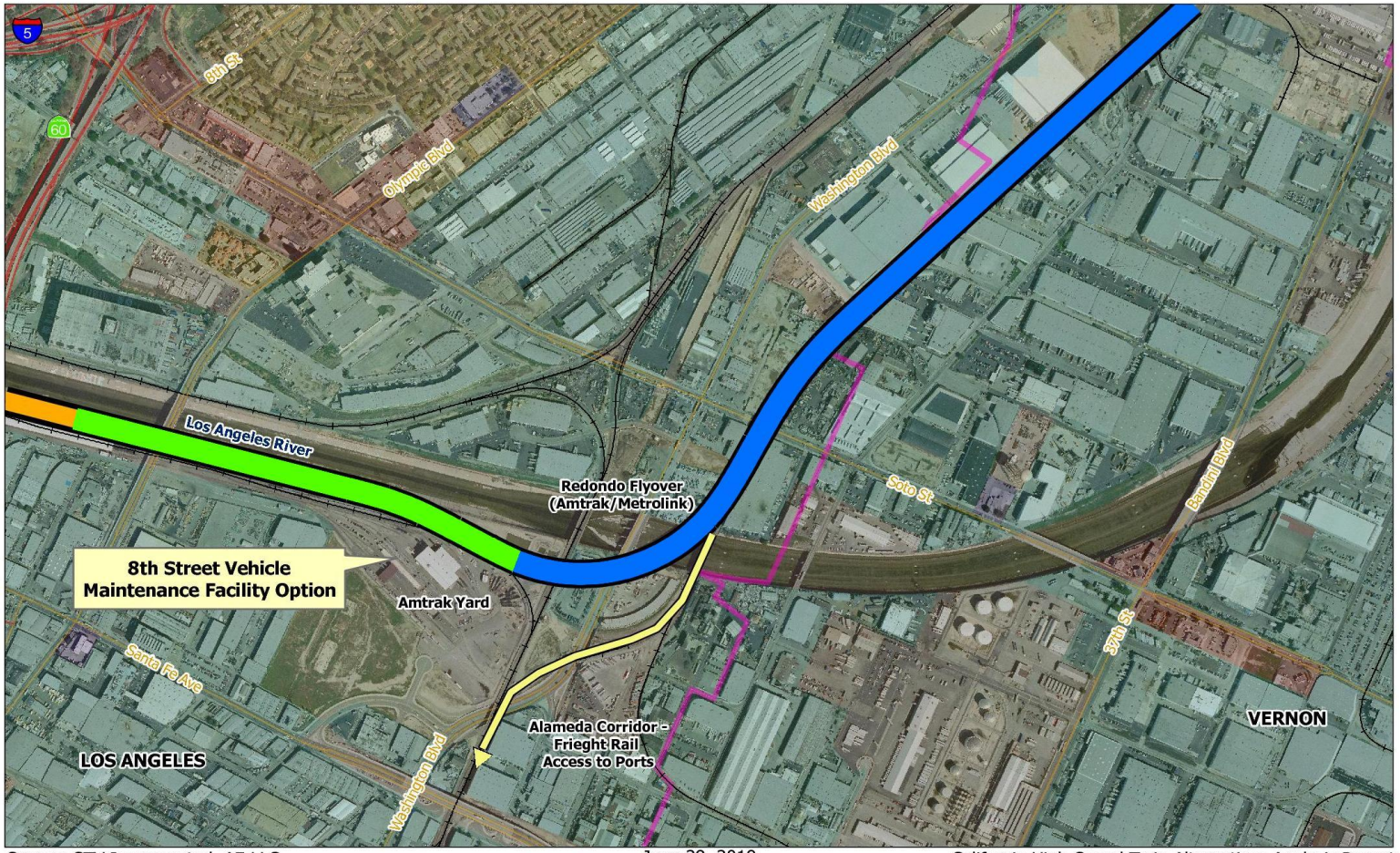
A tunnel crossing of the Los Angeles River was also investigated due to stakeholder comments received after the release of the Draft AA Report. Such a configuration would have a higher cost than an aerial crossing of the Los Angeles River, and there is not a suitable location for a tunnel portal adjacent to the East Bank of the river, resulting in a tunnel that would need to be at least several miles long. Due to these factors, a tunnel crossing of the Los Angeles River was eliminated from further consideration.

An overview of the Los Angeles River Crossing area is provided in Figure 5.3-1.

5.3.1 Option to be Carried Forward

- **Aerial LA River Crossing**

Figure 5.3-1 Los Angeles River Crossing – Overview



Source: STV Incorporated, AE LLC

June 29, 2010

California High-Speed Train Alternatives Analysis Report

0 250 500 1,000 Feet

0 100 200 400 Meters

Legend

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant
- City Boundaries

Los Angeles River Crossing
Consolidated Shared-Track - Overview

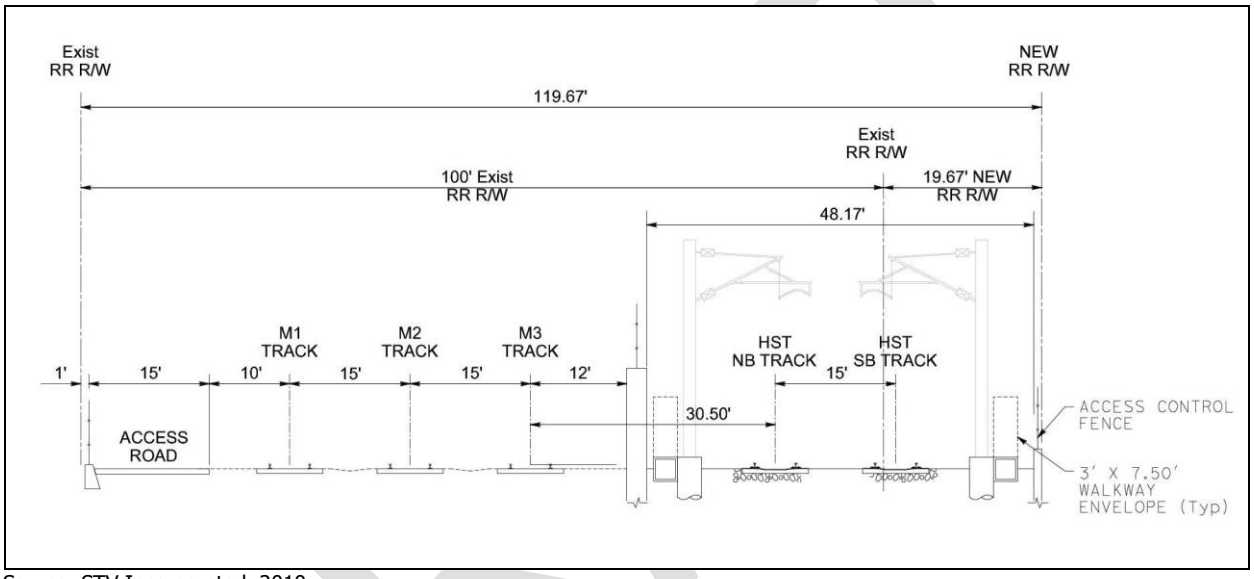
5.4 MONTEBELLO / PICO RIVERA

Through Montebello and the western portion of Pico Rivera, there is residential development on the north side of the LOSSAN corridor and industrial development on the south side. In this area, an at-grade alignment with ROW acquisition the south of the corridor will be investigated in addition to the typical aerial alignment to determine the trade-offs between at-grade ROW impacts and impacts from an aerial structure.

5.4.1 At-Grade Option

The at-grade option would require ROW acquisition to the south of the existing LOSSAN corridor. A typical cross-section is shown in Figure 5.4-1.

Figure 5.4-1 Typical Cross-Section – Montebello / Pico Rivera – At-Grade Option

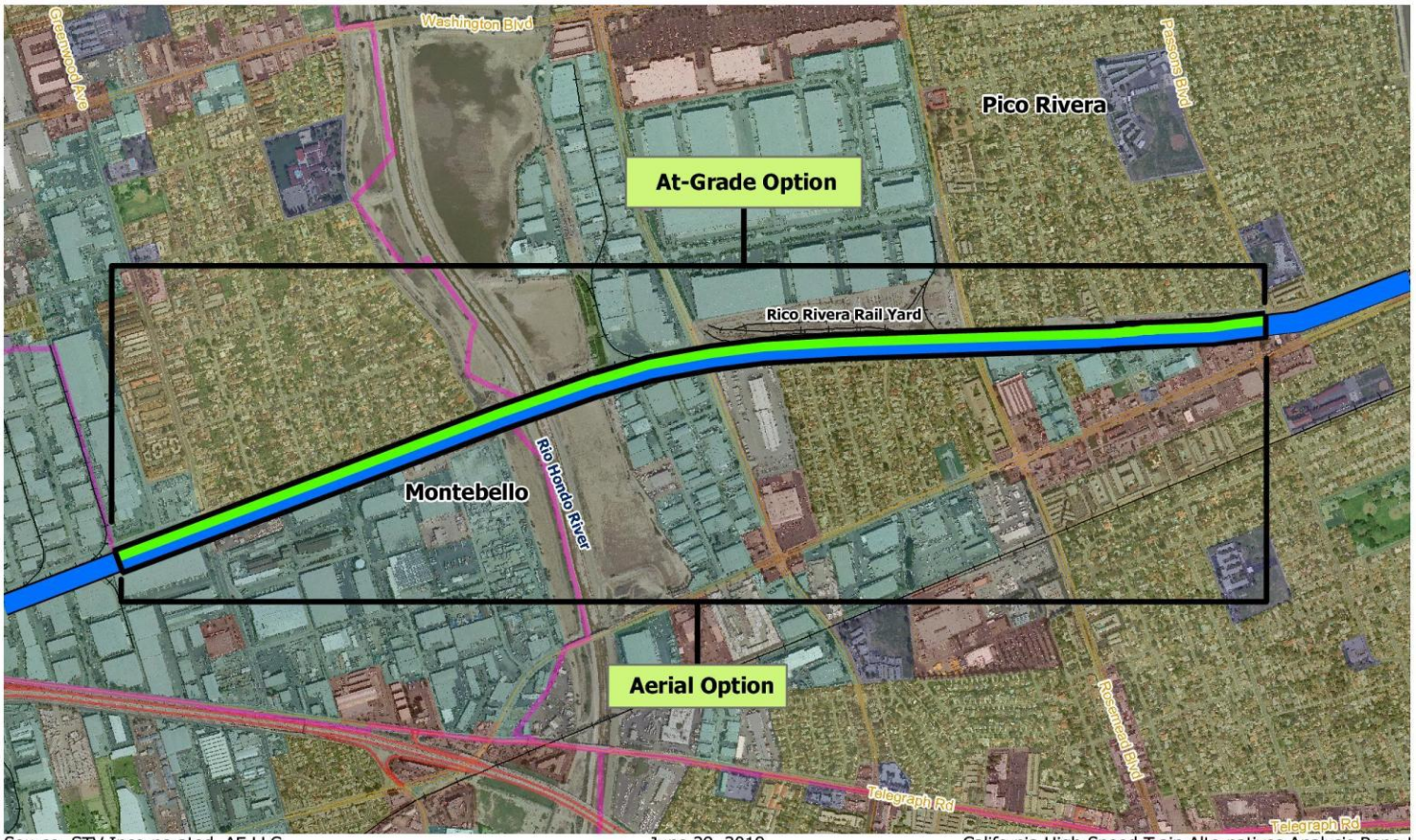


Source: STV Incorporated, 2010

5.4.2 Aerial Option

The aerial option would construct a typical aerial cross-section on the south side of the ROW, as shown previously in Figure 3.7-2.

Figure 5.4-2 Montebello / Pico Rivera – Overview



Source: STV Incorporated, AE LLC

June 29, 2010

California High-Speed Train Alternatives Analysis Report

Legend

0 625 1,250 2,500 Feet

0 175 350 700 Meters

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

City Boundaries

Montebello / Pico Rivera
Consolidated Shared Track - Overview

Table 5.4-1 Evaluation Table – Montebello / Pico Rivera

Evaluation Measure	At-Grade Option	Aerial Option
Design Objectives		
Ridership / Revenue Potential	No difference between options.	
Intermodal Connections	No stations proposed in this subsection.	
Capital Costs	Requires industrial property acquisitions, but less-expensive at-grade guideway construction.	Avoids needing to acquire large amounts of ROW, but added cost for aerial guideway construction.
Operating Costs	No difference between options.	
Operations Issues	No major operations issues.	
Land Use		
Station Area Development Potential	No stations proposed in this subsection.	
Consistency with Other Planning Efforts	No inconsistencies with other planning efforts.	
Constructability		
Construction Access Issues	Greenwood Avenue, Paramount and Rosemead Boulevards and Passons Avenue will allow for construction access in area.	
Railroad Impacts	Requires shifting and reconfiguration of LOSSAN corridor tracks and Pico Rivera yard. Potential construction impacts as well as permanent yard operations impacts.	No major impacts to existing railroad operations expected.
Utility Impacts	Several utility crossings in area. No expected difference between options.	
Neighborhood / ROW Impacts		
Displacements	Requires industrial and commercial property acquisitions on south side of corridor.	Does not require major property acquisitions.
Property Access Issues	No major changes in property access expected.	
Station Area Traffic Effects	No HST stations are proposed in this subsection.	
Grade Crossing Traffic Effects	Current at-grade crossings and Serapis Avenue and Passons Blvd to be grade separated or closed as part of BNSF Third Main Track Project. Potential temporary construction impacts to Greenwood Avenue and Paramount and Rosemead Boulevards when constructing new HST bridge adjacent to existing railroad bridge.	Current at-grade crossings and Serapis Avenue and Passons Blvd to be grade separated or closed as part of BNSF Third Main Track Project. No grade crossing effects anticipated.
Resource Impacts		
Waterways / Sensitive Habitat Areas	Both options cross Rio Hondo and adjacent detention basins on new bridge adjacent to existing railroad bridge. There are no sensitive habitats in this area that would be affected.	
Cultural Resources	There are no cultural resources within this area that would be affected.	
Parklands	There are no parklands within this area that would be affected.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	
Environmental Impacts		
Noise / Vibration	Potential sensitive receptors in residential neighborhoods to north and south of alignment. Option would move freight tracks closer to residential properties north of alignment and east of Rosemead Boulevard.	An aerial structure would potentially impact sensitive receptors in residential neighborhoods to north and south of alignment.
Visual / Scenic Resources	Residential neighborhoods on the north and south side of the LOSSAN corridor may be impacted by this option.	An aerial structure would have the potential to impact visual and scenic resources in the residential neighborhoods on the north and south side of the LOSSAN corridor.
Geologic / Soil Constraints	There are no known geologic or soils constraints within this area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

5.4.3 Conclusions

The typical aerial configuration in this area could generate noise and visual impacts for the surrounding neighborhoods, but would result in fewer property acquisitions than the At-Grade Option. The At-Grade Option will minimize noise and visual impacts to the surrounding community, but require ROW acquisition from industrial and commercial properties on the south side of the corridor. Both options will be carried forward to further determine benefits and impacts in the area.

5.4.4 Options to be Carried Forward

- **At-Grade Option**
- **Aerial Option**

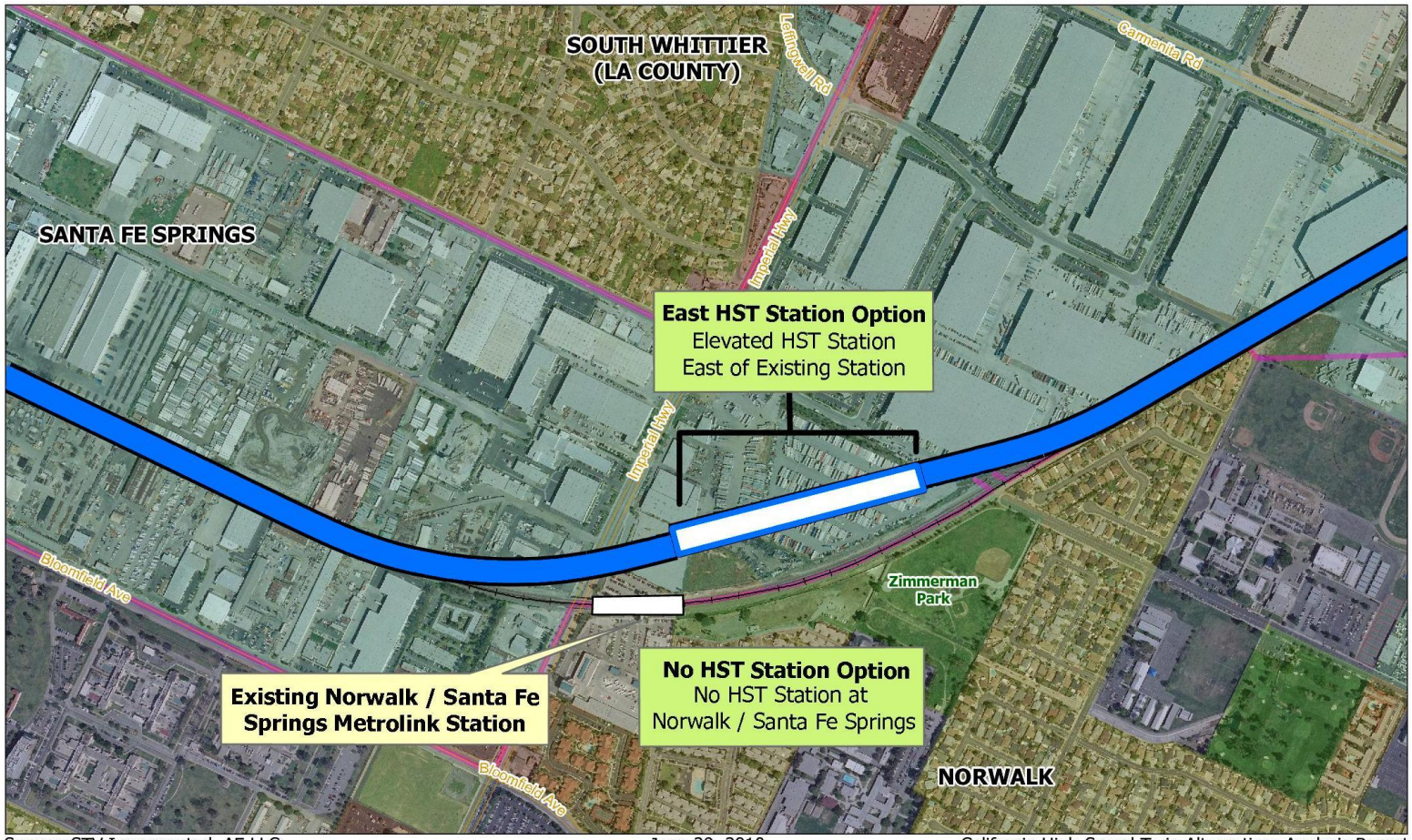
5.5 NORWALK / SANTA FE SPRINGS STATION

The current Norwalk / Santa Fe Springs Metrolink Station lies on a curve in the LOSSAN corridor just south of Imperial Highway on the boundary between the cities of Norwalk and Santa Fe Springs. Four tracks run through the station, with a pedestrian aerial structure connecting two side platforms. The westernmost Metrolink track is aligned slightly differently than the other three tracks to allow for a straight southbound station platform.

The preferred alternative from the program-level environmental analysis included a HST station at Norwalk / Santa Fe Springs. With a Fullerton Station Option also being considered for this section as well, it is likely only one station will be built. The benefits and impacts of HST stations at Norwalk / Santa Fe Springs and Fullerton will be thoroughly examined as part of this study, and the expected outcome is the selection of one station or the other after publishing the Draft EIR/EIS.

There are two options that are currently being examined for the Consolidated Shared-Track Alternative at Norwalk / Santa Fe Springs Station: a No HST Station Option and an East HST Station Option. They are described in the following subsections and shown in Figure 5.5-1. The options are evaluated in Table 5.5-1.

Figure 5.5-1 Norwalk / Santa Fe Springs Station – Overview



Source: STV Incorporated, AE LLC June 29, 2010 California High-Speed Train Alternatives Analysis Report

Legend

0 300 600 1,200 Feet

0 95 190 380 Meters

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

City Boundaries

Norwalk / Santa Fe Springs Station
Consolidated Shared-Track - Overview

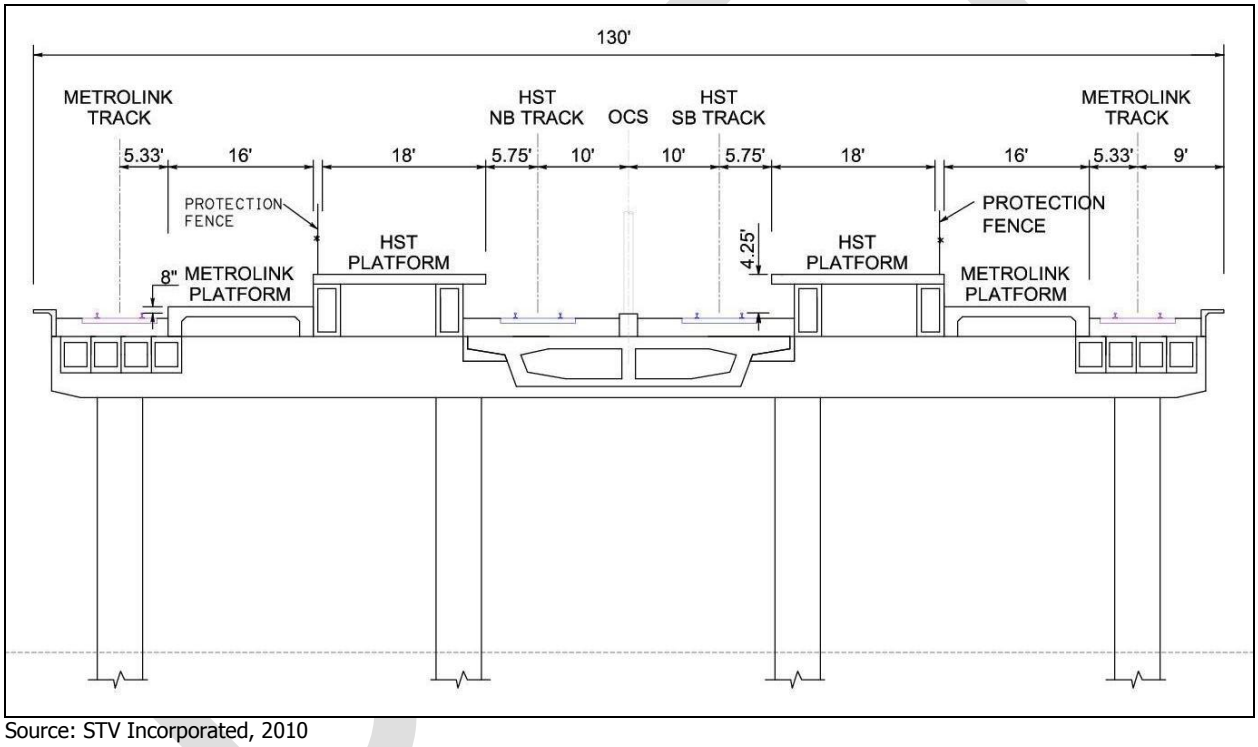
5.5.1 No HST Station Option

Even without an HST station at Norwalk / Santa Fe Springs, a new aerial station would need to be constructed at Norwalk / Santa Fe Springs to allow Metrolink (and possibly Amtrak) trains to serve the area. A four-track, two platform structure that would run on an aerial structure east of the Metrolink station and existing tracks would be constructed similar to the East HST Station Option described in Section 5.5.2, but HST trains would not stop and HST platforms would not be needed.

5.5.2 East HST Station Option

The existing Metrolink station is on a curve and HST station design criteria require that HST stations be built on straight sections of track. This requires the new HST and Metrolink station to be built on the inside of the existing curve as shown in Figure 5.5-1. The aerial station would be designed with four platforms to support four passenger rail lines (two for HST and two for Metrolink). A typical cross-section for this option is shown in Figure 5.5-2.

Figure 5.5-2 Typical Cross-Section – Norwalk / Santa Fe Springs Station – East HST Station Option



Source: STV Incorporated, 2010

Table 5.5-1 Evaluation Table – Norwalk / Santa Fe Springs Station

Evaluation Measure	No HST Station Option	East HST Station Option
Design Objectives		
Ridership / Revenue Potential	No riders can access HST system at Norwalk / Santa Fe Springs.	Norwalk / Santa Fe Springs HST station serves northern Orange County, southern Los Angeles County, western Riverside and San Bernardino counties.
Intermodal Connections	No access to HST from other modes at station.	Allows for easy connections to Metrolink trains at new HST/Metrolink station.
Capital Costs	Capital costs include the cost of an aerial structure with straight station platforms, property acquisitions and station expenses for Metrolink/Amtrak Station (no HSTs would stop).	Capital costs include the cost of an aerial structure with straight station platforms, property acquisitions and station expenses.
Operating Costs	Amtrak/Metrolink-only station is less expensive to operate than East HST Station option (no HSTs stopping).	HST station is more expensive to operate than no-station option.
Operations Issues	No major operations issues foreseen.	Curves into HST station will be sharper than existing curve to allow for straight station tracks. Since all HSTs are projected to stop at station, this will result in only a minimal travel time increase.
Land Use		
Station Area Development Potential	There will not be a HST station in this area to stimulate station area development.	Station would allow for some development of surrounding area, which is mainly made up of industrial and commercial uses. Norwalk and Santa Fe Springs have expressed minimal interest in developing station area.
Consistency with Other Planning Efforts	No major planning efforts underway in station area.	
Constructability		
Construction Access Issues	Existing station and road crossings provide access for construction activities in area.	
Railroad Impacts	Likely temporary construction issues for LOSSAN corridor tracks underneath long skewed aerial crossing in Imperial Highway vicinity.	
Utility Impacts	Several utility crossings in area. Several large underground oil pipelines cross LOSSAN corridor in existing Metrolink station vicinity.	
Neighborhood / ROW Impacts		
Displacements	Acquisition of large industrial parcels both north and south of Imperial Highway would be needed. Acquisitions likely include at least eight industrial buildings and a large number of parking spaces and trailer storage areas are expected.	Acquisition of large industrial parcels both north and south of Imperial Highway would be needed. Acquisitions likely include at least eight industrial buildings and a large number of parking spaces and trailer storage areas are expected.
Property Access Issues	HST tracks may require minor property access changes in vicinity of Imperial Highway crossing.	
Station Area Traffic Effects	There will not be a HST station in this area to affect traffic.	Construction and operation of a HST station would induce large numbers of new auto and transit trips in the Norwalk / Santa Fe Springs station area.
Grade Crossing Traffic Effects	Current at-grade crossing at Lakeland Road to be grade separated as part of BNSF Third Main Track Project. Potential temporary construction impacts for all crossings when constructing new HST bridge adjacent to existing railroad bridge.	
Resource Impacts		
Waterways / Sensitive Habitat Areas	There are no waterways or sensitive habitats within this area that would be affected.	
Cultural Resources	There are no known cultural resources within this area that would be affected.	
Parklands	Zimmerman Park is located south of existing station on the west side of the LOSSAN corridor. Zimmerman Park is specifically designed for baseball / softball games; there are no other recreational facilities on the park site. Construction and operation of a HST Station either to the east or north of the existing station would have potential to impact the use of the park.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	

Evaluation Measure	No HST Station Option	East HST Station Option
Environmental Impacts		
Noise / Vibration	Multi-family (MF) residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment noise impacts.	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment noise impacts. The area surrounding the HST station option is generally industrial.
Visual / Scenic Resources	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment visual impacts.	MF residential uses located on the west side of the LOSSAN corridor south of Civic Center Drive have the potential to be affected by HST alignment visual impacts. The area surrounding the HST station option is generally industrial.
Geologic / Soil Constraints	There are no known geologic or soils constraints within the area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

5.5.3 Conclusions

The No HST Station Option would likely have lower costs and fewer environmental impacts than the East HST Station Option, but would not provide for HST service at Norwalk / Santa Fe Springs (Metrolink and Amtrak trains would provide service in area). The East HST Station Option provides service and access to Norwalk and Santa Fe Springs, but would cost more than the No HST Station Option and would require ROW acquisitions and property relocations.

Both options will be carried forward for further examination in the Draft EIR/EIS, with a focus on comparing the Norwalk / Santa Fe Springs station option to the Fullerton HST station options discussed in Section 5.8.

5.5.4 Options to be Carried Forward

- **No HST Station Option**
- **East HST Station Option**

5.6 LA MIRADA RAIL YARDS

The Consolidated Shared-Track Alternative through La Mirada Rail Yards is similar to the at-grade configuration of the Dedicated HST Alternative through this section (but with one fewer freight/passenger track), and is described in Section 4.7.

An overview of the La Mirada Rail Yards area is shown in Figure 4.7-1, typical cross sections shown in Figure 4.7-3, and an evaluation of the options shown in Table 4.7-1.

5.6.1 Option to be Carried Forward

- **At-Grade Option**

5.7 BUENA PARK / FULLERTON AIRPORT

The Consolidated Shared-Track Alternative through Buena Park / Fullerton Airport is similar to the at-grade configuration of the Dedicated HST Alternative through this section (but with one fewer freight/passenger track), and is described in Section 4.8.

An overview of the Buena Park / Fullerton area is shown in Figure 4.8-1 with typical cross sections shown in Figure 4.8-2 thru Figure 4.8-4 and an evaluation of the options shown in Table 4.8-1.

5.7.1 Option to be Carried Forward

- **Underpass Option**

5.8 FULLERTON

Starting just east of the Fullerton Airport the Consolidated Shared-Track alignment will return to at-grade where is will stay all the way to the HST terminal station at ARTIC.

A typical cross-section through the city is shown in Figure 5.4-1.

5.8.1 Option to be Carried Forward

- **At-Grade on South Side of ROW**

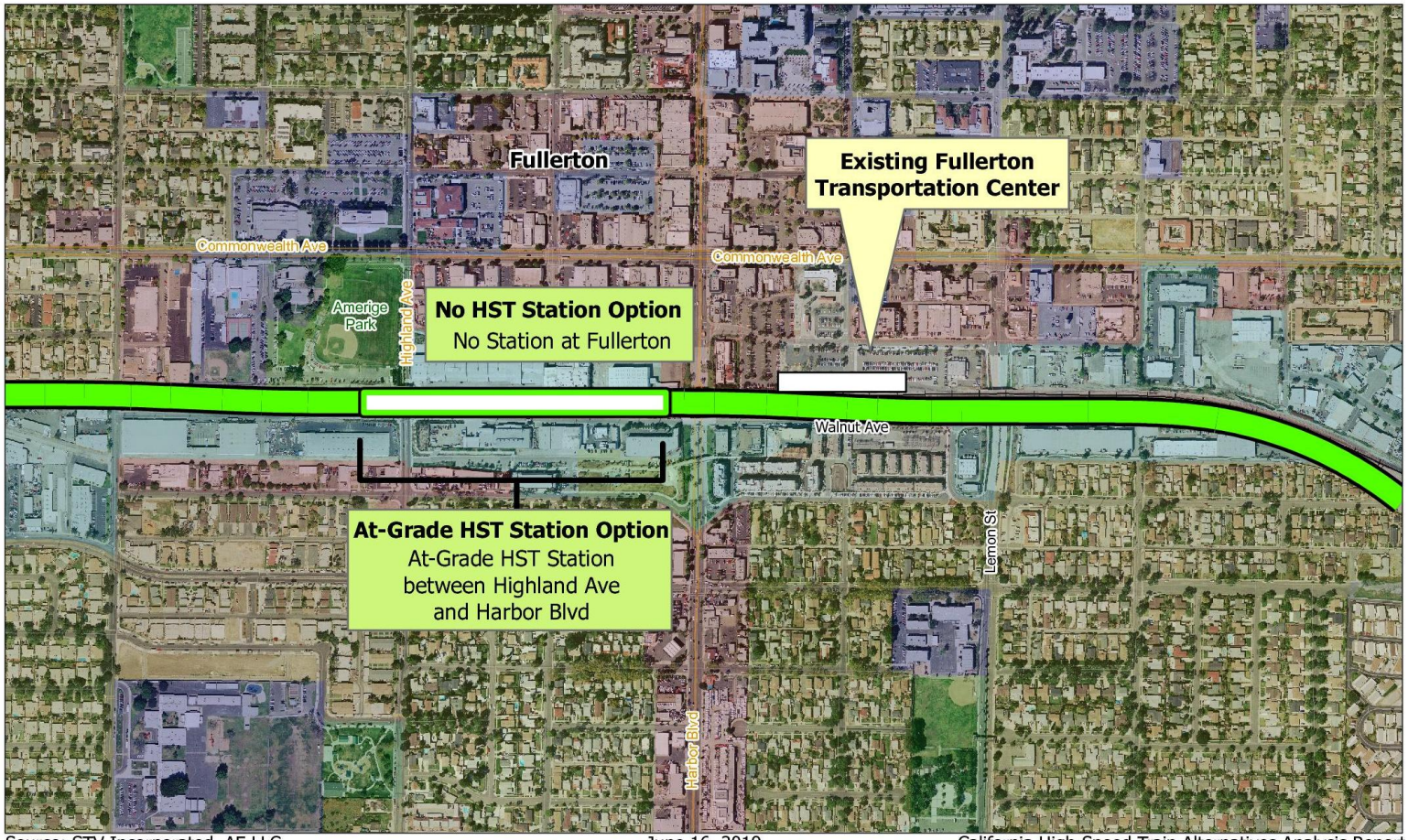
5.9 FULLERTON STATION

The existing Fullerton Transportation Center (FTC) is the busiest rail station in Orange County and serves the Metrolink Orange County and 91 Lines as well as the Amtrak Pacific Surfliner and Southwest Chief routes. Three tracks currently pass through the station, with side platforms on the north and south sides of the tracks. As part of the OCTA 30-Minute Metrolink Service Expansion program, a fourth track is being built on the south side of the existing south platform to allow for additional trains to operate between Fullerton and Laguna Niguel. Additional expansion at-grade beyond the planned four-track footprint will be difficult, with city streets, new transit-oriented development, and historic structures all located in close proximity to the tracks. An overview of the station area is given in Figure 5.9-1.

The preferred alternative from the program-level environmental analysis did not include an HST station at Fullerton. Comments received during the scoping process for the Project EIR/EIS in favor of a Fullerton HST station have led to a reexamination of the inclusion of a station at Fullerton. A Fullerton Station option will be examined as part of the project-level environmental process.

There are two options that are explored in the Fullerton Station area: at-grade without an HST station and at-grade with an HST station. The options are evaluated in Table 5.9-1.

Figure 5.9-1 Fullerton Station – Overview



Source: STV Incorporated, AE LLC June 16, 2010 California High-Speed Train Alternatives Analysis Report

Legend

Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

0 250 500 1,000 Feet
0 80 160 320 Meters

Fullerton Station
Consolidated Shared-Track - Overview

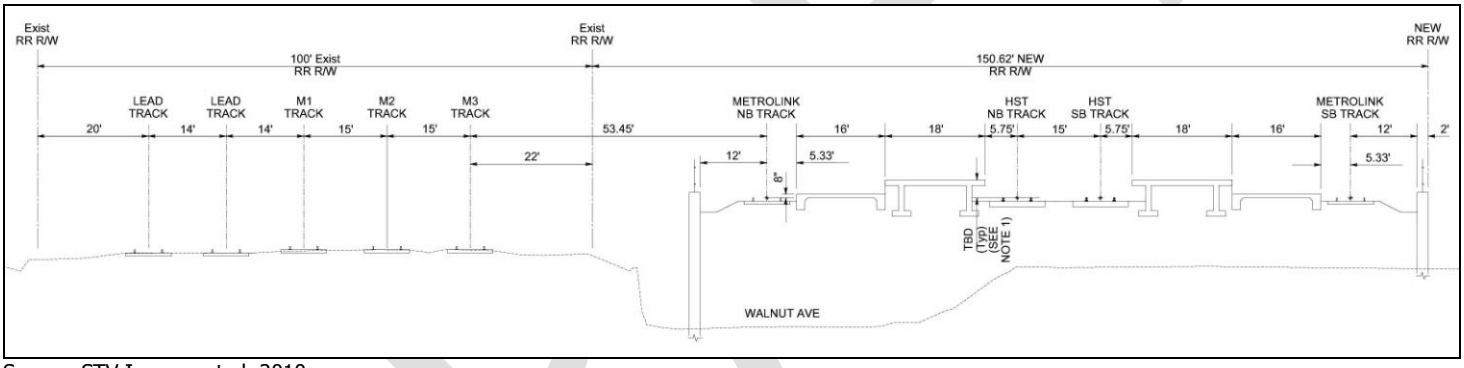
5.9.1 No HST Station Option

Similar to the Norwalk / Santa Fe Springs, new station platforms would need to be constructed at Fullerton to allow Metrolink and Amtrak trains to serve the area from the two dedicated passenger tracks. A four-track, two platform station west of the existing Metrolink station and south of the existing tracks would be constructed similar to the At-Grade HST Station Option described in Section 5.9.2, but HST trains would not stop and HST platforms would not be needed. The existing pedestrian bridge over the tracks would need to be rebuilt to accommodate the additional HST tracks.

5.9.2 At-Grade HST Station Option

The other option is to construct an at-grade HST station in Fullerton. To simplify intermodal connections, the best location for the new HST station would be directly parallel of the existing Metrolink/Amtrak station, but because the existing station is located in a constrained area and there is little room to expand. Instead, the HST station would be located immediately to the west of the existing station and south of the existing tracks between Highland Avenue and Harbor Boulevard. The at-grade HST Station Option would have four platforms for two HST tracks and two Metrolink tracks, and four through tracks parallel to the HST station. A typical cross section is illustrated in Figure 5.9-2.

Figure 5.9-2 Typical Cross-Section – Fullerton Station – At-Grade HST Station Option



Source: STV Incorporated, 2010

Table 5.9-1 Evaluation Table – Fullerton Station Options

Evaluation Measure	No HST Station Option	At-Grade HST Station Option
Design Objectives		
Ridership / Revenue Potential	No riders can access HST system at Fullerton. Access would be provided in Anaheim, 5 miles to the south.	Fullerton HST station serves northern Orange County, southern Los Angeles County, western Riverside and San Bernardino counties.
Intermodal Connections	Option would require reconfiguration of FTC's pedestrian connection to south.	FTC allows for transfers between HST, Metrolink, Amtrak, and buses. Option would require reconfiguration of FTC's pedestrian connection across LOSSAN corridor.
Capital Costs	Capital costs include station expenses for Metrolink/Amtrak Station (no HSTs would stop).	At-grade HST station is more expensive to build than no-station aerial option.
Operating Costs	Amtrak/Metrolink-only station is less expensive to operate than At-Grade HST Station option (no HSTs stopping).	At-grade HST station is more expensive to operate than no-station option.
Operations Issues	Potential staging issues with Fullerton Turnback Facility.	HST stations at Anaheim and Fullerton would be very close and limit HST speeds through area. The existing sharp curve just east of Fullerton station would remain, limiting operational speeds through this area to 60 mph (97 kph).

Evaluation Measure	No HST Station Option	At-Grade HST Station Option
Land Use		
Station Area Development Potential	Fullerton is already site of major TOD activity, but new development would lack direct access to HST.	HST station would enhance existing TOD plans in area.
Consistency with Other Planning Efforts	Enhanced Transportation Center is consistent with the City of Fullerton's Framework Plan, which identifies infrastructure improvements needed to support future redevelopment goals.	
Constructability		
Construction Access Issues	Access to LOSSAN corridor via several road crossings and FTC.	
Railroad Impacts	Requires modifications to Fullerton Turnback Facility which is currently under construction on south side of LOSSAN corridor.	Will introduce temporary impacts to existing station during construction, and modifications to Fullerton Turnback Facility.
Utility Impacts	Several utility crossings in area. No expected difference between options.	
Neighborhood / ROW		
Displacements	Majority of HST footprint can be accommodated between existing tracks and Walnut Street in existing parking areas and public space.	Will require the acquisition of existing industrial uses on both the north and south side of the tracks between Highland Ave and Harbor Blvd.
Property Access Issues	Require modifications to Walnut Street, possibly modifying access for residential and commercial uses within FTC area.	
Station Area Traffic Effects	There is little potential for additional traffic impacts from the addition of HST tracks.	Would introduce large numbers of new riders in autos and buses to FTC station area.
Grade Crossing Traffic Effects	Potential temporary construction impacts for area crossings when constructing new HST bridge adjacent to existing railroad bridge.	
Resource Impacts		
Waterways / Sensitive Habitat Areas	There are no waterways or sensitive habitats within this area that would be affected.	
Cultural Resources	Potential exists for the addition of HST tracks to impact cultural resources within the historic depot station area.	The addition of HST tracks and a new station within close proximity to the historic depot building could result in potential impacts to cultural resources.
Parklands	Amerige Park is located directly north of the LOSSAN corridor and west of Highland Ave. A recreational trail is located south of and parallel to the LOSSAN corridor in the area.	
Agricultural Lands	There are no agricultural lands within this area that would be affected.	
Environmental Impacts		
Noise / Vibration	There is a potential for construction and operational noise and vibration impacts to adjacent commercial, residential, and historic buildings.	
Visual / Scenic Resources	Installing HST tracks through the Fullerton Station area would alter the appearance of the existing station.	An at-grade station would have a potential impact on the visual / scenic resources in adjoining residential and historic station areas by blocking views and creating shadows. The HST Station itself would be designed to fit into the architectural theme in the Fullerton Station area.
Geologic / Soil Constraints	There are no known geologic or soils constraints within the Fullerton Station area.	
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.	

5.9.3 Conclusions

The No HST Station Option has lower costs and environmental impacts than the At-Grade HST Station Option, but does not provide for HST service at Fullerton, currently the busiest rail station in Orange County (Metrolink and Amtrak trains would provide service in the area). The At-Grade HST Station Option does provide service at Fullerton and opportunities to transfer between HST, Metrolink, Amtrak and local buses, but has the potential for more impacts to the surrounding community than the No HST Station Option. These potential impacts include congestion, property acquisitions and potential visual and noise impacts.

Both options should be carried forward for further examination in the Draft EIR/EIS, with a focus on comparing the Fullerton HST station options to the Norwalk / Santa Fe Springs station options discussed in Section 5.5.

5.9.4 Options to be Carried Forward

- **No HST Station Option**
- **At-Grade HST Station Option**

5.10 ANAHEIM

The LOSSAN corridor through the City of Anaheim carries lower volumes of rail traffic than the Hobart Yard to Fullerton subsection, as the large numbers of BNSF freight trains serving the ports of Los Angeles and Long Beach split from the LOSSAN corridor at Fullerton Junction to head towards Riverside and the eastern United States.

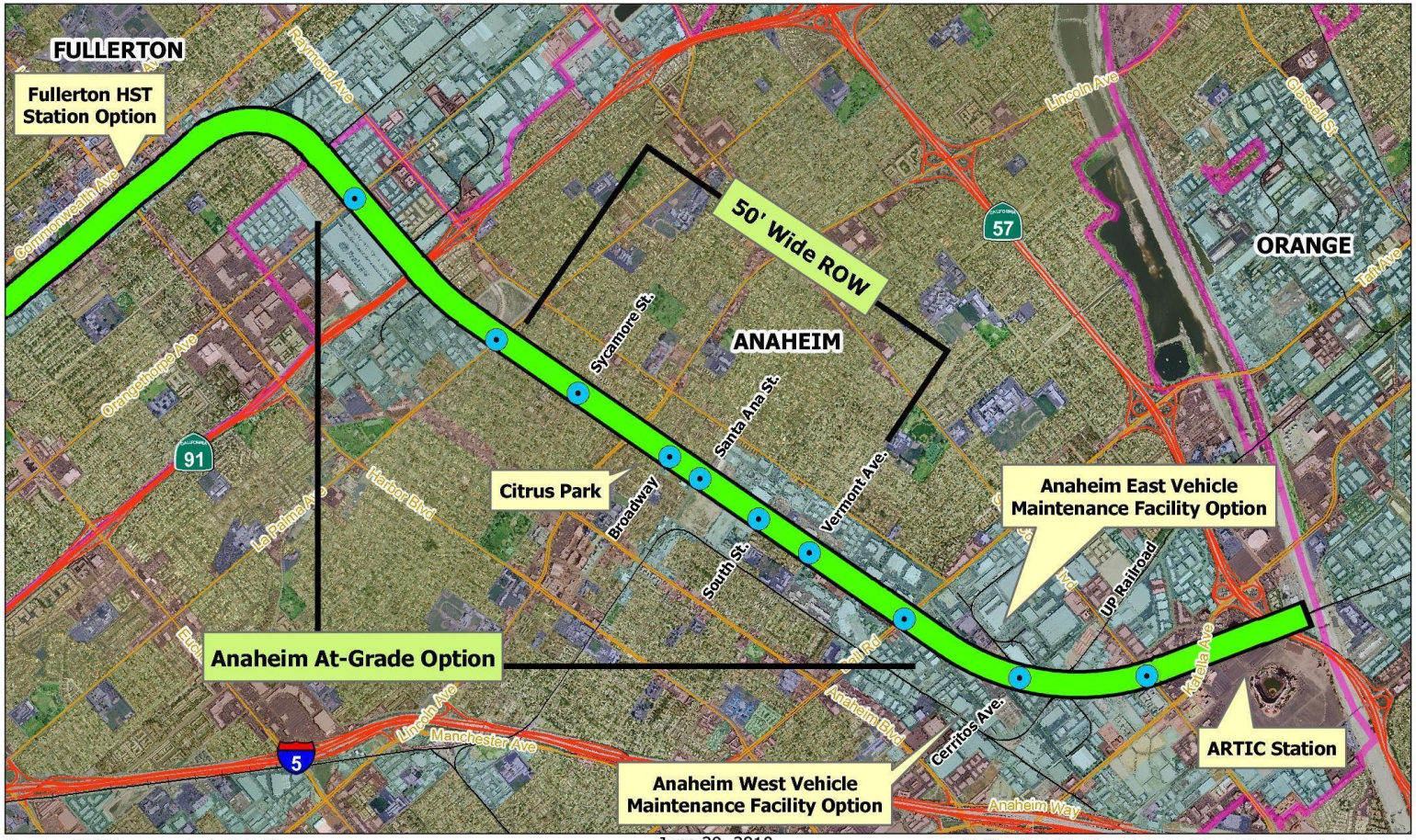
This subsection mainly carries Amtrak and Metrolink passenger trains, with only five to ten local freight trains per day. The ROW is 50' (15.2 meters) wide (1.5 miles / 2.4 kilometers) through Anaheim between North Street and Vermont Avenue, and 100 feet (30.5 meters) wide otherwise. Land uses abutting the ROW are generally industrial south of Santa Ana Street in the 50' (15.2 meters) section, and generally residential to the north. Citrus Park and the Colony Historical District directly about the ROW between Broadway and Lincoln Avenue. Four roadways currently cross the LOSSAN corridor at-grade in this section (Sycamore Street, Broadway, Santa Ana Street and South Street), with at-grade crossings at either end of the section as well (La Palma Avenue to the north, Vermont Avenue to the south). Lincoln Avenue crosses beneath the railroad tracks in an underpass structure near the center of the 50' (15.2 meters) wide section of ROW.

There are currently two railroad tracks in this section of the ROW, with one centered on the ROW and the second to the west.

For the high operating speeds of high-speed trains along the LOSSAN corridor, all highway crossings will need to be grade separated to ensure maximum safety for train passengers and auto drivers and to minimize potential delays to rail service. The eight grade separations and two crossing closures proposed for the ten current at-grade crossings in Anaheim are discussed further in Section 3.4 of the 2009 Draft AA Report.

Given the lower volumes of freight and passenger trains that use the LOSSAN corridor through Anaheim, the Consolidated Shared-Track Alternative allows HSTs to share the two existing tracks with other operators through Anaheim (freight trains would need to be temporally separated). An overview of the At-Grade Anaheim Option is shown in Figure 5.10-1, and typical cross-section for this option is shown in Figure 5.10-2.

Figure 5.10-1 Anaheim – Overview



Source: STV Incorporated, AE LLC

June 29, 2010

California High-Speed Train Alternatives Analysis Report

Legend

0 0.25 0.5 1 Miles

0 0.25 0.5 1 Kilometers

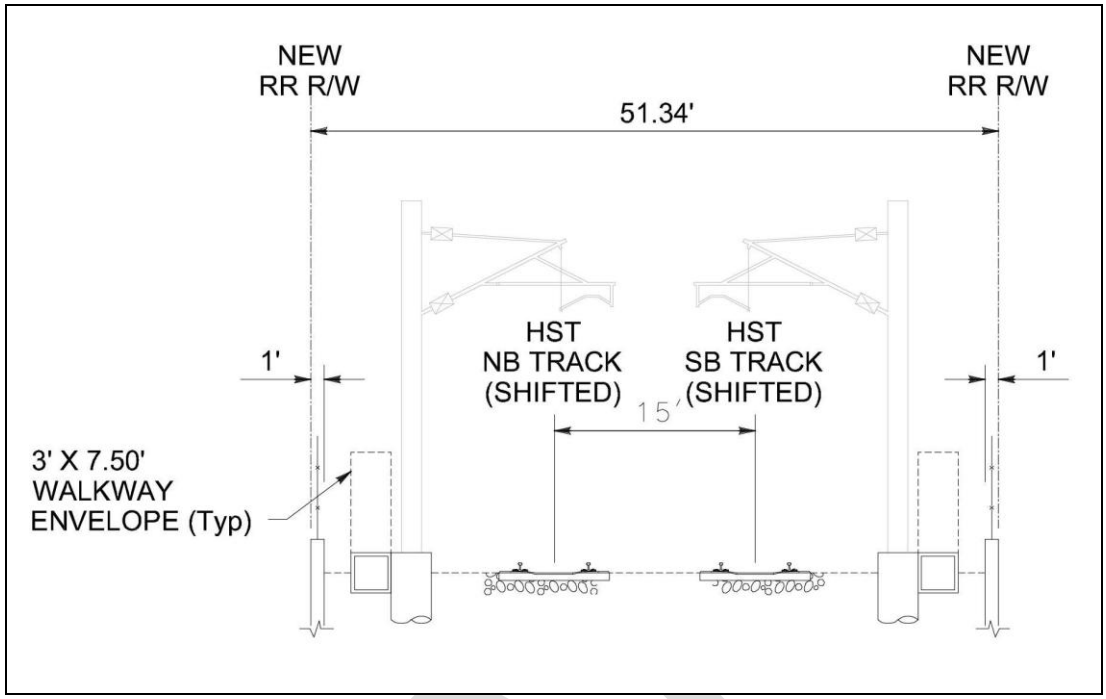
Vertical Profile
- At-Grade
- Aerial
- Fill
- Trench
- Tunnel (Cut & Cover)
- Tunnel (Bored)

Land Uses
- Low Density Residential
- Medium / High Density Residential
- Commercial
- Industrial
- Extraction
- Public Facilities / Institutions
- Transportation / Utilities
- Military Installations
- Mixed Use
- Open Space / Recreation
- Agriculture
- Water / Floodways
- Vacant

- City Boundaries
- Existing At-Grade Crossing

Anaheim
Consolidated Shared Track - Overview

Figure 5.10-2 Typical Cross-Section – Anaheim 50' ROW – At-Grade Option



Source: STV Incorporated, 2010

5.10.1 Conclusions

The Anaheim At-Grade Option would have few construction issues because no additional tracks would be added through the area. In addition, it provides grade separations for all railroad operators in the corridor, a potential benefit to the surrounding community in reducing train horn noise and traffic congestion. This option is proposed to be carried forward for analysis in the Draft EIR/EIS.

5.10.2 Option to be Carried Forward

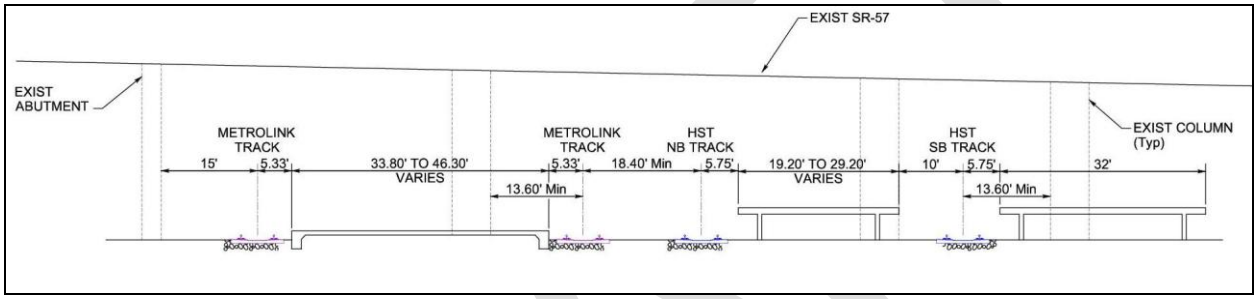
- **At-Grade Option**

5.11 ARTIC

The proposed southern terminus of the LA-A HST project would be the Anaheim Regional Transportation Intermodal Center (ARTIC), a transit facility currently being planned by the City of Anaheim and OCTA (see Section 3.3.8 for more detail). There is one at-grade HST station design being considered for ARTIC. The ARTIC area is shown in the lower right of Figure 5.10-1.

The at-grade station would extend to underneath the SR-57 freeway and would include four tracks and three platforms configured as follows: two HST tracks served by two side platforms and two Metrolink / Amtrak tracks served by one center platform. The tracks and platforms extend underneath the SR-57 freeway underpass, and would not require extensive reconstruction of the roadway structure to fit the HST tracks and platforms. Additional tracks for storing and servicing the trains will be located to the east or west of the station, as discussed further in Section 6.0. A typical cross-section for this option is provided in Figure 5.11-1.

Figure 5.11-1 Typical Cross-Section – ARTIC – East At-Grade HST Station Option



Source: STV Incorporated, 2010

5.11.1 Option to be Carried Forward

- **East At-Grade HST Station Option**

6.0 Vehicle Maintenance Facility

Section not included in 2009 Draft AA Report and added as follows:

6.1 INTRODUCTION

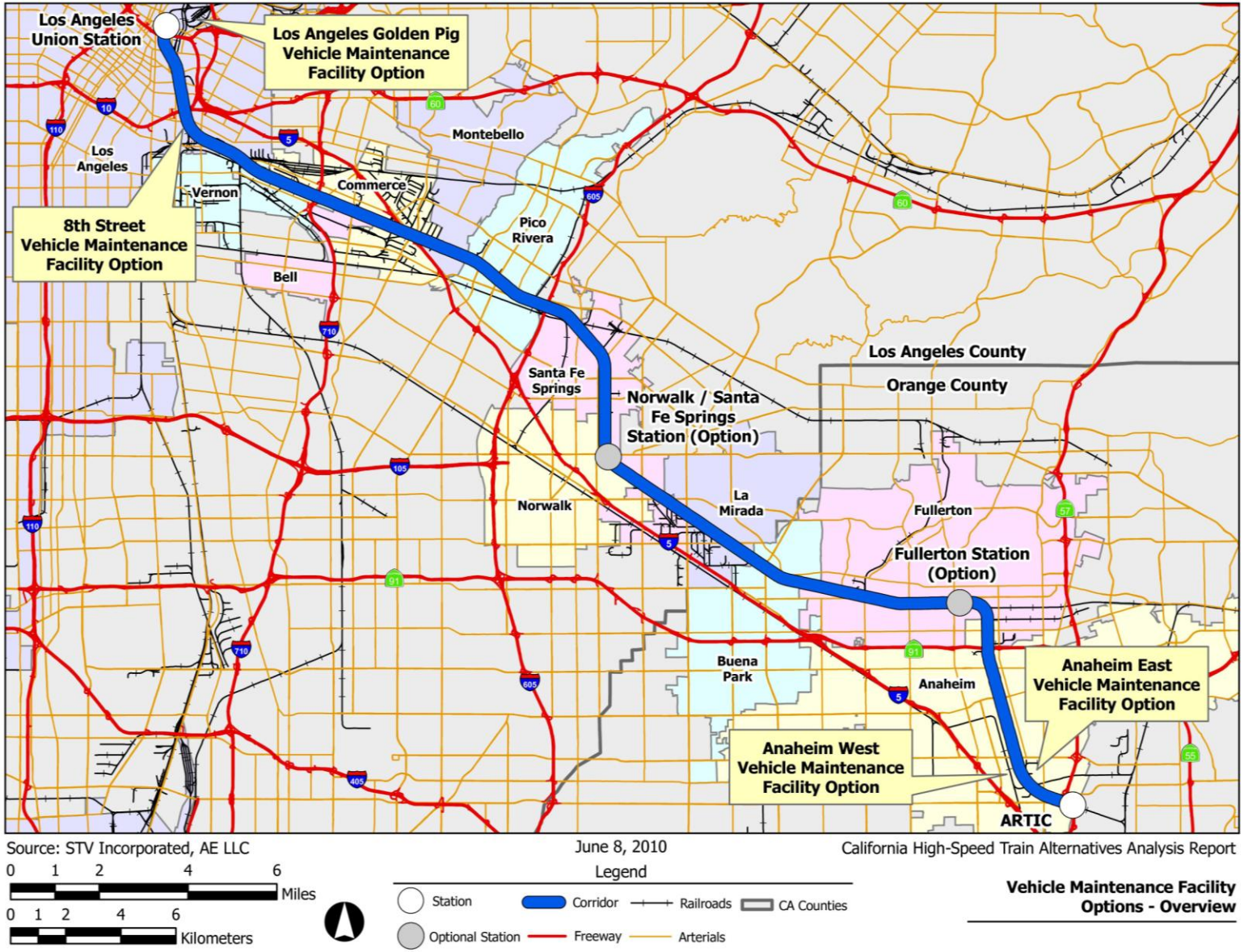
A Vehicle Maintenance Facility (VMF) is needed between Los Angeles and Anaheim to service, inspect, maintain and store equipment for the initial phase of the HST service, as well as to accommodate additional equipment as the service expands in the future. The design of the VMF will include the following site elements:

- Storage (Layup) Tracks for cleaning, sanding and overnight storage of trainsets. Suitable for Level 1 and Level 2 inspection and maintenance activities
- Maintenance Shop Building for Level 1, 2 and 3 inspection and maintenance activities, including wheel truing and replacement of train wheelsets and trucks (bogies)
- Bulk Stores Building with truck loading dock
- Train Washer
- Wheel Inspection Building
- Yard Operations Control Center – may be located in a freestanding tower, or co-located in one of the other buildings (depending upon operational requirements to be determined)
- Car Cleaners' Facility – a stand-alone building to accommodate car cleaners working at the storage tracks
- Hazardous Materials Storage Building
- Train Crew Reporting and Dispatching Support Area
- Administrative and Employee Welfare Areas – as required at applicable buildings
- Commissary Facility with truck loading dock
- Employee and visitor parking
- Site roadways, utilities, lighting and landscaping

Generally, the VMF should be built near the northern or southern end of the corridor to allow for a short distance between the VMF and nearest terminus station. After an initial examination of potential sites along the LA-A project, three locations have been proposed for the VMF as shown in Figure 6.1-1.

One option, called the "Golden Pig", is located to the east of LAUS and the Los Angeles River at the northern end of the corridor in Los Angeles. Two additional options are located in Anaheim – the West Option located between Ball Road and Cerritos Avenue on the west side of the LOSSAN corridor, and the East Option, also located between Ball Road and Cerritos Avenue but to the east of the LOSSAN corridor. These sites are described in the following sections and evaluated in Table 6.5-1.

Figure 6.1-1 Vehicle Maintenance Facility Options – Overview

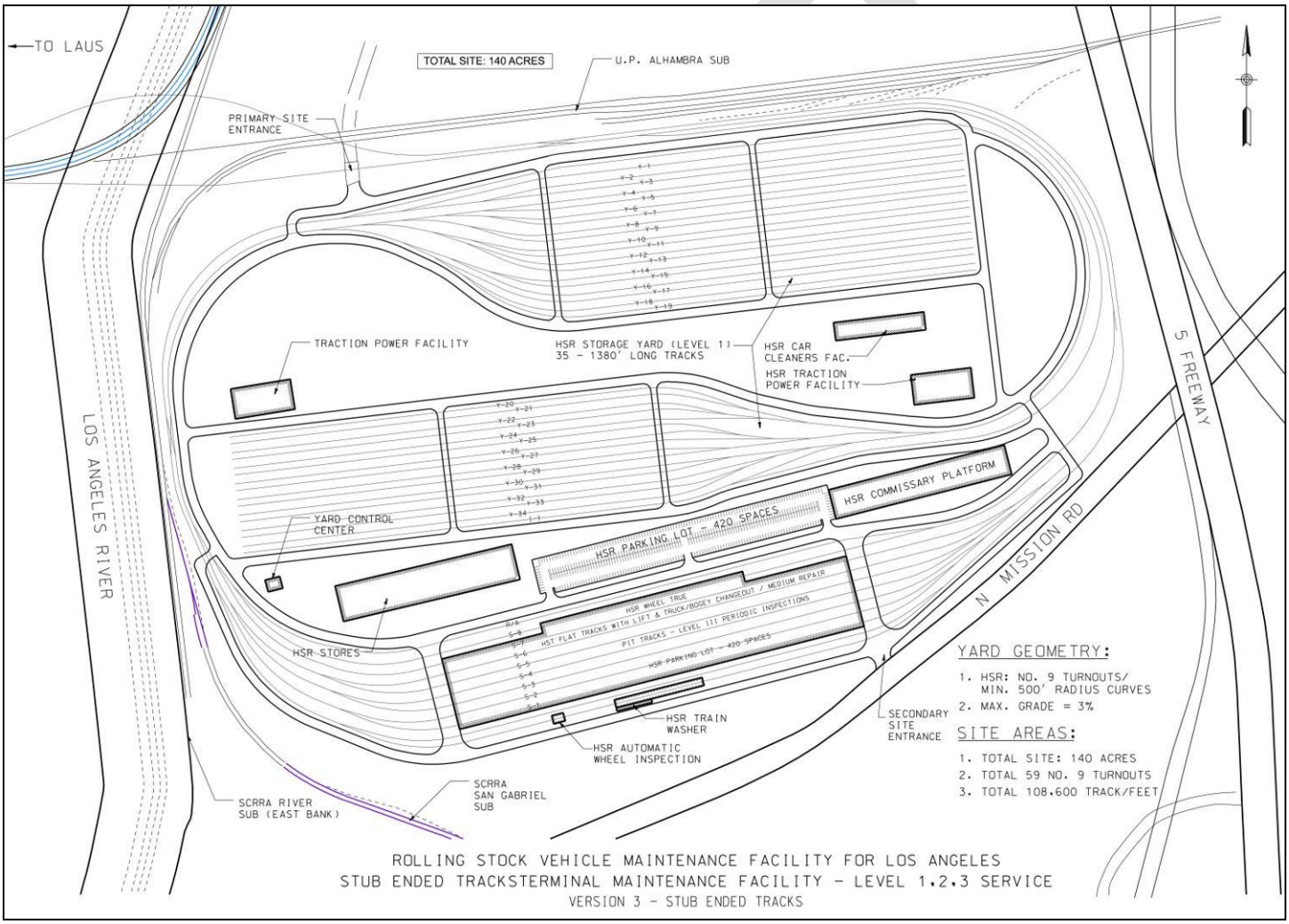


6.2 LOS ANGELES GOLDEN PIG OPTION

The Los Angeles "Golden Pig" option is located to the east of LAUS on the site of an existing UP rail yard (as shown in Figure 4.1-3). The Golden Pig Option would accommodate all of the functions and site elements required of a VMF. For example, the site has been designed to include stub-end storage tracks and run-through Shop tracks, in addition to a standalone Bulk Stores Building in close vicinity to the Shop Building. The Train Washer and Wheel Inspection Building has been located on a dedicated yard track south of the Shop Building.

The primary site entrance is off of Lamar Street, and the secondary site entrance is off of Mission Road. The site roadway layout has minimized track crossings, but not eliminated them – vehicles entering the site will cross either two or three tracks. A conceptual yard layout is shown in Figure 6.2-1.

Figure 6.2-1 Los Angeles Golden Pig Option – Site Overview



Source: STV Incorporated, 2010

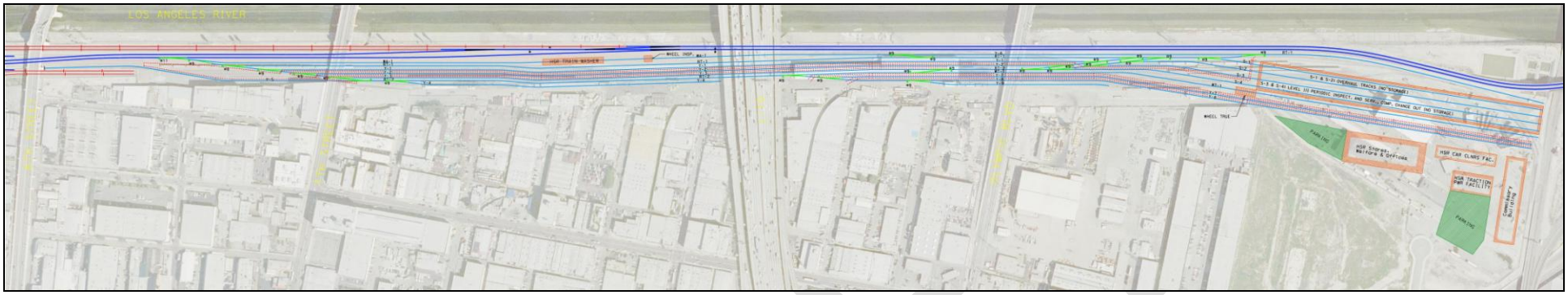
6.3 LOS ANGELES 8TH STREET OPTION

The Los Angeles 8th Street option is located to the south of LAUS near the I-10 freeway on the site of an existing Amtrak 8th Street Yard. This site has only recently been identified (May 2010) and additional analysis is need.

The 8th Street Yard Option would accommodate all of the functions and site elements required of a VMF with the limitation of the maintenance building being a stub ended configuration and not all the storage tracks required for the Los Angeles and Anaheim Section can be accommodated, representing 11 trains sets versus 17 full trainsets in all other Options. This will require that other storage tracks be located at or near Anaheim to accommodate the overnight storage and morning start up requirements. This site has double ended storage tracks and is in close proximity to the LAUS. In addition the standalone Bulk Stores Building and Commissary Building are in close vicinity to the Shop Building. The Train Washer and Wheel Inspection Building are located on a dedicated yard track north of the Shop Building.

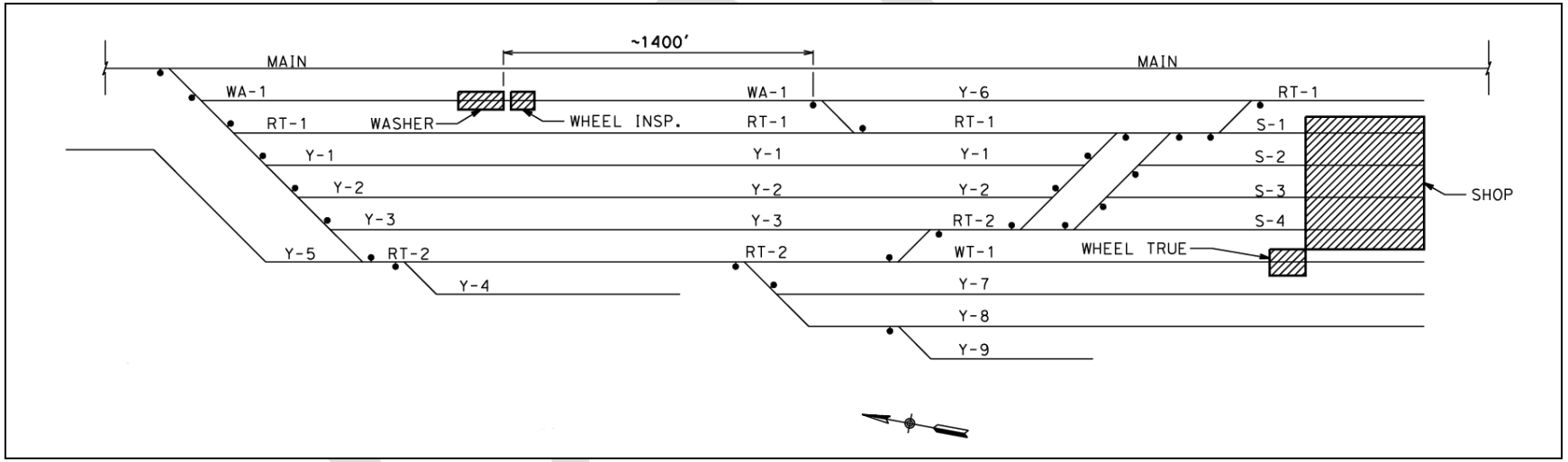
The primary site entrance is off of East 16th Street and the secondary site entrance is off of 8th Street. The site roadway layout has some limitations as piers from the overhead road bridges may restrict full access to the full length of a trainset if it is stored under a bridge. There will be a number of track crossings for vehicles servicing storage trainsets. Vehicles entering the site will not have to cross any tracks to service the Shop, Bulk Stores or Commissary Buildings. A conceptual yard and track layout is shown in Figure 6.3-1 and Figure 6.3-2.

Figure 6.3-1 Los Angeles 8th Street Option – Site Overview



Source: STV Incorporated, 2010

Figure 6.3-2 Los Angeles 8th Street Option – Track Layout



Source: STV Incorporated, 2010

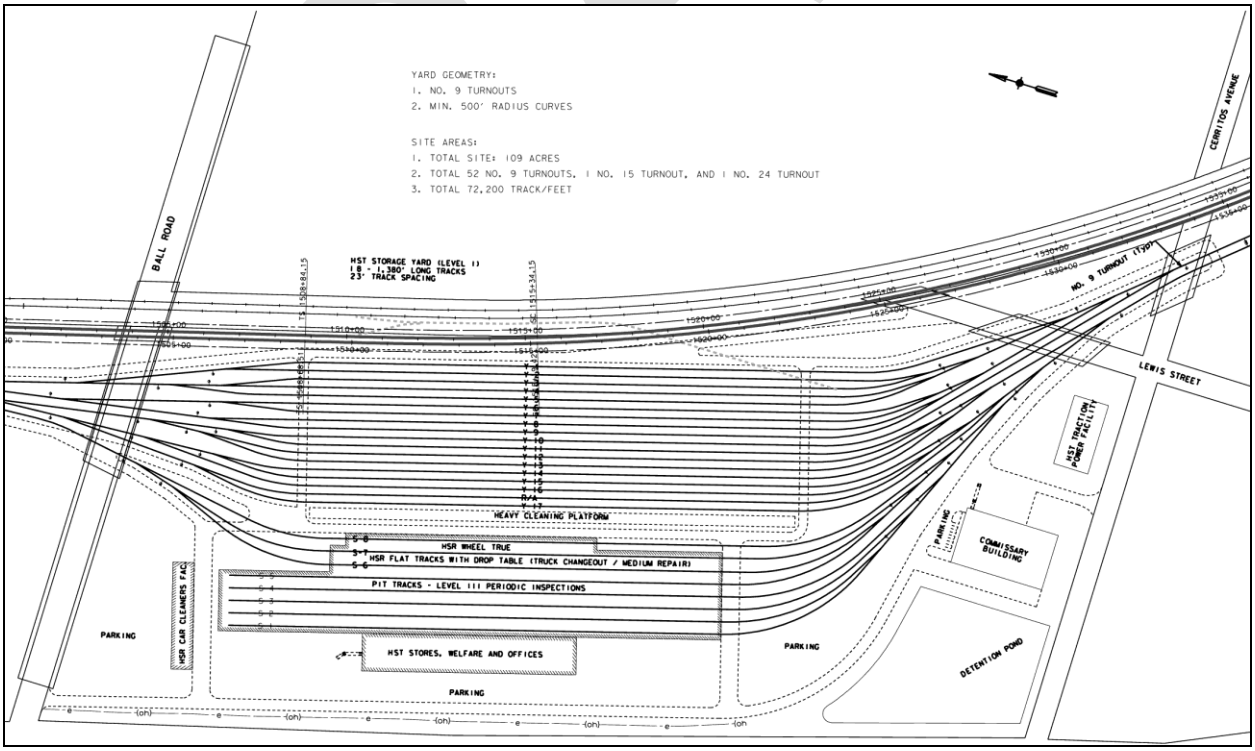
6.4 ANAHEIM WEST OPTION

The Anaheim West Option is located to the north of ARTIC on the west side of the LOSSAN corridor, as shown in Figure 4.11-3. It is also able to accommodate the necessary functions and site elements required of a HST VMF. The site has been designed with run-through storage tracks on the east side of the yard, which run roughly parallel to the main line. Due to site constraints, the Maintenance Shop Building has run-through tracks for the Wheel Truing Track and Drop Table Tracks, and stub-end tracks for the Level 3 Pit Tracks. The Bulk Stores Building has been located adjacent to the Maintenance Shop Building, to take advantage of shared parking, roadway access and improved flow of parts. A conceptual drawing is provided in Figure 6.4-1.

Employee welfare areas and office space can be located either above the Stores Building or above the Shop Building. Figure 6.4-1 shows it located above the Stores Building, where it has the advantage of being immediately adjacent to the parking area. The Car Cleaners' Facility is located close to the storage tracks, with its own parking area, and at-grade covered storage for service carts. Further consideration will be given to co-locating the Transportation crew facilities with the Car Cleaners' Facility, so that train crews are closer to the vehicles on the storage tracks. The Train Washer has been located on the north yard lead track, based on the understanding that a majority of the trains will be coming out of service from the Los Angeles direction. A Wheel Inspection Building has been located on each yard lead track, based on the assumption that every train set must pass over the wheel inspection device daily.

The site roadways have been designed such that nearly all vehicles, entering from either Ball Road or Cerritos Avenue, can reach their destination in the yard without having to cross a track. This is particularly beneficial for employee and visitor vehicles and delivery trucks. The exception would be flatbed trucks that would have to go to the Shop Building to pick up or drop off trucks (bogies) at the drop table release track area. An emergency access entrance is also provided off of Lewis Street.

Figure 6.4-1 Anaheim West Option – Site Overview



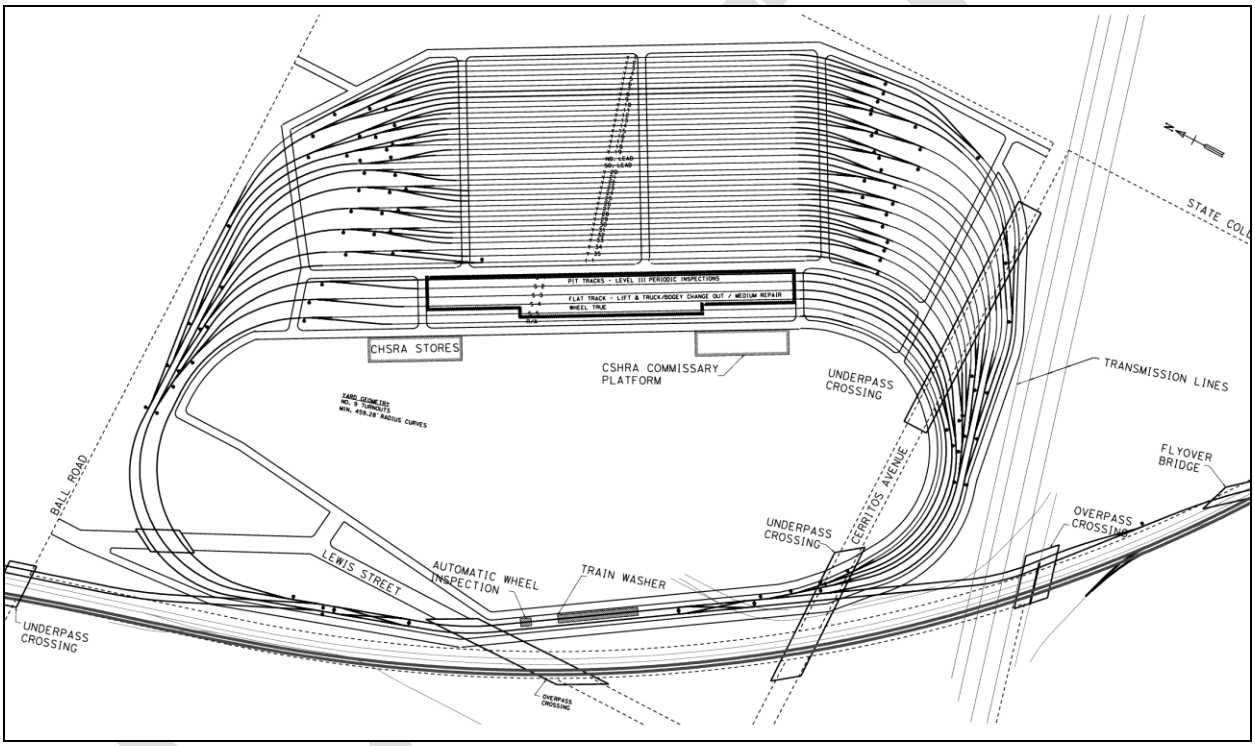
Source: STV Incorporated, 2010

6.5 ANAHEIM EAST OPTION

The Anaheim East Option is located north of ARTIC and across the LOSSAN corridor from the Anaheim West Option as shown in Figure 4.11-3. It accommodates all functions and site elements necessary for a VMF, with the exception of three Level 3 pit tracks in the Shop Building. This site is designed with run-through storage and shop tracks. The Bulk Stores Building is a stand-alone structure, but still close to the Shop Building. The Train Washer and Wheel Inspection Building have been located on a dedicated yard track on the west side of the yard and in line with the yard lead track.

Site access is from Lewis Street, with emergency entrances off of Ball Road and Cerritos Avenue. An internal 'loop' roadway provides access to all buildings without vehicles having to cross tracks (with the exception of flatbed trucks having to go to the release track area in the Shop Building). A conceptual site overview is provided in Figure 6.5-1.

Figure 6.5-1 Anaheim East Option – Site Overview



Source: STV Incorporated, 2010

Table 6.5-1 Evaluation Table – Vehicle Maintenance Facility Options

Evaluation Measure	Los Angeles Golden Pig Option	Los Angeles 8th Street Option	Anaheim West Option	Anaheim East Option
Design Objectives				
Operations Issues	Would require new flyovers of Los Angeles River and existing railroad tracks to connect to HST alignment north of LAUS. Squarish site with connection at only one end makes for difficult yard layout and inefficient use of space. Located close to northern end of project (LAUS), allowing for short dead-heading (non-revenue operation) of trains to and from LAUS but long dead-head moves to ARTIC.	Would require the construction of new access tracks from LAUS and connection to the Redondo Flyover structure for southbound movements. The site is long and narrow and the trainsets would have to be moved through the Train Washer and Wheel Inspection pit, then into a storage track in a seesaw manner. The Shop building is a stub ended layout which will lessen its full capacity due to need to clear a train on the same track that the next train must use to access the building. Located close to northern end of project (LAUS), allowing for short dead-heading (non-revenue operation) of trains to and from LAUS but long dead-head moves to ARTIC.	Would be able to connect to HST tracks at-grade. Longer site layout allows for more efficient use of space and yard layout. Would have difficult north connection to Anaheim Deep Tunnel Option, possibly requiring single-ended yard. Located close to southern end of project (ARTIC), allowing for short dead-head moves of empty trains to and from ARTIC but long dead-head moves to LAUS.	Would require new flyover of existing LOSSAN corridor track to connect to HST alignment north of ARTIC. Squarish site makes for difficult yard layout and inefficient use of space. Would have difficult north connection to Anaheim Deep Tunnel Option, possibly requiring single-ended yard. Located close to southern end of project (ARTIC), allowing for short dead-head moves of empty trains to and from ARTIC but long dead-head moves to LAUS.
Land Use				
Economic Benefits	All options have similar sizes and economic benefits to surrounding cities.			
Consistency with Other Planning Efforts	Site lies to east of Los Angeles River, current focus of greening efforts, in primarily industrial area.	Site lies along the LA River, is in an active railroad yard undergoing significant expansion improvements and will require the relocation of Amtrak Maintenance Operations to Taylor Yard (current Metrolink maintenance facility north of the LAUS terminal), and relocation of Metrolink maintenance facilities.	Both options lie in industrial areas to north of Anaheim's Platinum Triangle redevelopment area.	
Availability of Labor	All options have similar accessibility to the large labor markets in Los Angeles and Orange Counties.			

Evaluation Measure	Los Angeles Golden Pig Option	Los Angeles 8th Street Option	Anaheim West Option	Anaheim East Option
Constructability				
Capital and Operating Costs	Requires new connection to HST tracks over Los Angeles River and relocation of existing UP rail yard functions. Similar operating costs for all options.	Will require demolition of existing Amtrak facilities and construction of new infrastructure. Requires modification of the Taylor Maintenance Yard for Amtrak operational requirements, requires the expansion of the current Colton EMF and a new maintenance facility in Irvine to support Metrolink operations.	Both Anaheim options require new at-grade connection to HST tracks and relocation of industrial properties which currently occupy sites. Similar operating costs for all options.	
Construction Access Issues	Mission Road and I-10 lie on south side of site and Marengo Street and I-5 are located on east side of site. North and west site boundaries are existing railroad corridors.	16th, 8th, and Proter Streets service the site. All are narrow city streets.	Both options are served by a number of arterial roadways which surround the sites, including Ball Road to the north and Cerritos Avenue to the south. I-5 and SR-57 are also in close proximity.	
Utility Impacts	Potential conflicts with high-voltage power lines which run parallel to Los Angeles River.	Potential conflicts with the overhead road bridges that cross the site.	Potential conflicts with high-voltage power lines which run along west side of LOSSAN corridor through this area.	Potential conflicts with high-voltage power lines which run parallel to Cerritos Avenue.
Neighborhood / ROW Impacts				
Displacements	Requires displacement of approximately 140 acres of existing UP rail yard and industrial land uses.	Requires displacement of Amtrak Southern California maintenance operations to Taylor Yard. Requires displacement of Metrolink maintenance operations to Colton EMF and a new maintenance facility in Irvine.	Requires displacement of approximately 110 acres of industrial and commercial land uses.	Requires displacement of approximately 150 acres of industrial and commercial land uses.
Local Traffic Effects	All options have similar site uses and road access to adjacent arterials and nearby freeways, and are expected to have similar traffic impacts.	Site is limited to access on the north end from constrained industrial city streets. Access to the Shop, Bulk Storage and Commissary Buildings will be off of 16th Street which connects to Washington Boulevard.	All options have similar site uses and road access to adjacent arterials and nearby freeways, and are expected to have similar traffic impacts.	All options have similar site uses and road access to adjacent arterials and nearby freeways, and are expected to have similar traffic impacts.

Evaluation Measure	Los Angeles Golden Pig Option	Los Angeles 8th Street Option	Anaheim West Option	Anaheim East Option
Resource Impacts				
Waterways / Sensitive Habitat Areas	The Los Angeles River lies to the west of the site. There are no known sensitive habitats in the area to be affected.	The Los Angeles River lies to the east of the site. There are no known sensitive habitats in the area to be affected.	The Los Angeles River lies to the east of the site. There are no known sensitive habitats in the area to be affected.	There are no known waterways and sensitive habitats in the area to be affected.
Cultural Resources	There are no known cultural resources in the area to be affected.			
Agricultural Lands	There are no known agricultural lands in the area to be affected.			
Environmental Impacts				
Noise / Vibration	All options are sited in industrial areas separated by several blocks from residential areas, and have similar noise footprints.			
Hazardous Materials	There is a potential that underground contamination from the railroad and adjacent industrial land uses could impact construction in this area.			

6.6 CONCLUSIONS

The Los Angeles Golden Pig Option can accommodate a large VMF, but it has several drawbacks. They include an inefficient site layout, difficult connections to the existing HST alignment requiring a flyover, and the need to relocate a busy railroad yard. The 8th Street Option has better accessibility than the Golden Pig Option, but on a more limited site, which requires the relocation of the existing Amtrak yard. The Anaheim East Option has similar downsides to the Golden Pig Option, including an inefficient site layout and difficult connections to the existing HST alignment requiring a flyover. The Anaheim West Option has the best site layout, allowing the VMF to be approximately 1/3 smaller than the other two options. In addition, it has the best connections to the HST alignment, which are at-grade as opposed to flyovers needed for the other two options (which are on the opposite side of the LOSSAN corridor from the HST tracks). It is expected that most trains on the LA-A project will start and end their operations at Anaheim, with service continuing north to Northern California throughout the day. A site in Anaheim allows for the best HST operations, as HSTs will only have a short trip between the VMF and ARTIC at the start and end of each day.

The Los Angeles Golden Pig and Anaheim East Options are proposed for elimination based on their inefficient site layouts and difficult connections to the HST alignment. The Anaheim West Option is proposed to be carried forward for full analysis in the Draft EIR/EIS. Analysis of the Los Angeles 8th Street Option has not yet been fully completed. If it is determined to be viable, it will be carried forward through the environmental review process. In addition, other options for siting the VMF along the Los Angeles to Anaheim section of the LOSSAN corridor will continue to be investigated in coordination with stakeholders in the area.

6.7 OPTIONS ELIMINATED / CARRIED FORWARD

Options to be eliminated from further consideration:

- **Los Angeles Golden Pig Option**
- **Anaheim East Option**

Options to be carried forward:

- **Anaheim West Option**
- **Los Angeles 8th Street Option (Additional evaluation needed)**

7.0 Analysis Results / Conclusions

Section 5.0 in 2009 Draft AA Report replaced as follows:

The Dedicated HST Alternative and Consolidated Shared-Track Alternatives are to be advanced to preliminary design and environmental review as the Build Alternatives.

7.1 DEDICATED HST ALTERNATIVE

A summary of the subsection design options studied as part of this alternative is presented in Table 7.1-1, listing whether they will or will not be carried forward for analysis in the Draft EIR/EIS.

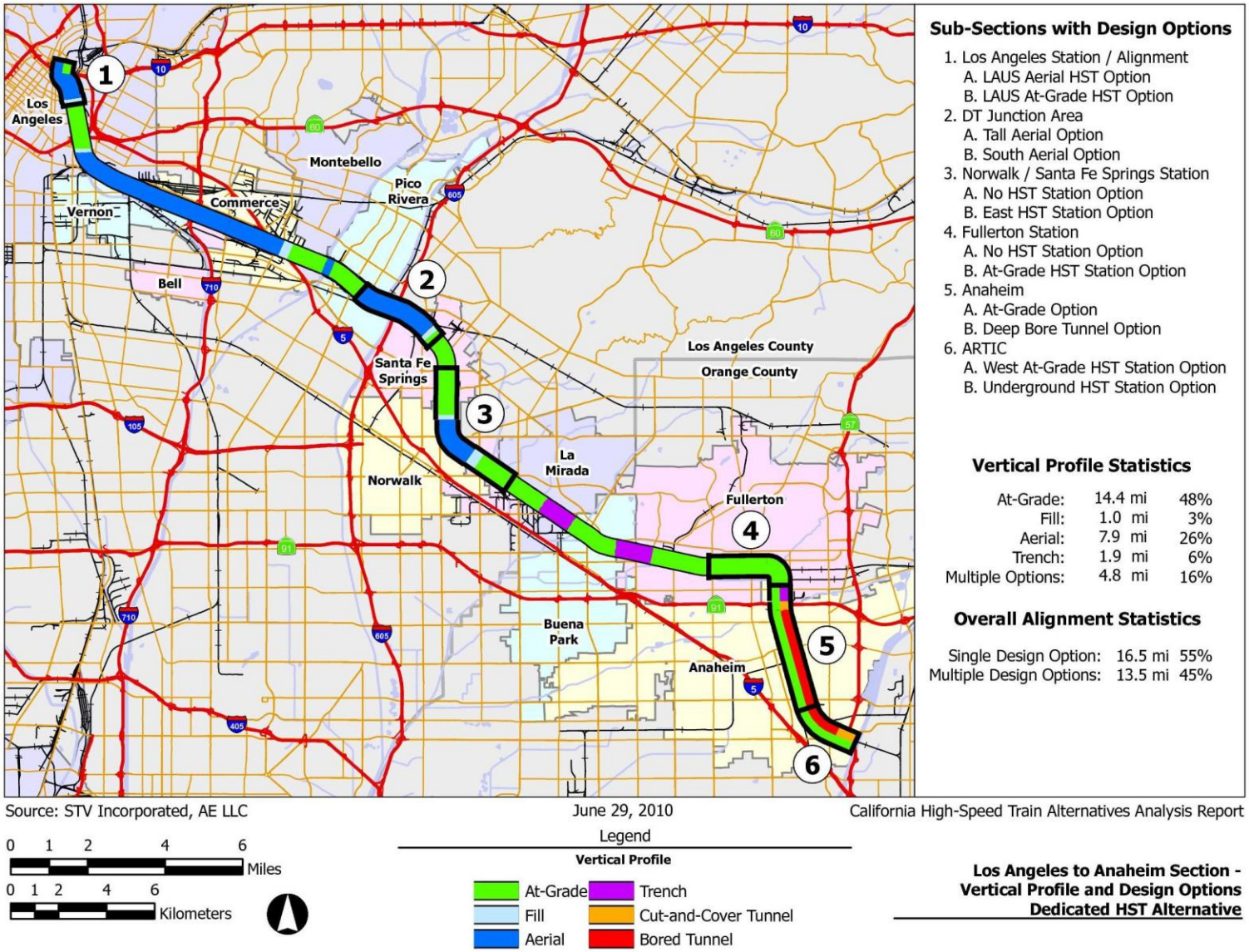
Table 7.1-1 Summary of Dedicated HST Alternative Subsection Design Options

#	A-LA HST Subsection	Design Options Carried Forward	Design Options Eliminated from Further Consideration
4.1	Los Angeles Station	• LAUS Aerial HST Station Option • LAUS At-Grade HST Station Option	• LAUS Deep Tunnel HST Station Option • Vignes Aerial HST Station Option • West Bank Trench HST Station Option
4.2	Los Angeles River	• At-Grade Option	• Tall Aerial Option
4.3	Vernon / Commerce Rail Yards	• I-710 Tall Aerial Option	• I-710 At-Grade Option
4.4	Pico Rivera Rail Yard	• Shifted Track Alignment Option	• Existing Track Alignment Option
4.5	DT Junction Area	• Tall Aerial Option • Aerial South Option	• At-Grade Option
4.6	Norwalk / Santa Fe Springs Station	• No HST Station Option • East HST Station Option	• North HST Station Option
4.7	La Mirada Rail Yards	• At-Grade Option	• Aerial Option
4.8	Buena Park / Fullerton Airport	• Underpass Option	• Flyover Option
4.9	Fullerton Station	• No HST Station Option • At-Grade HST Station Option	
4.10	Anaheim	• At-Grade Option • Deep Bore Tunnel Option	• Aerial Option • Cut-and-Cover Tunnel Option
4.11	ARTIC	• West At-Grade HST Station Option • Underground HST Station Option	• East At-Grade Station Option
6.0	Vehicle Maintenance Facility	• Anaheim West Option • Los Angeles 8th Street Option*	• Los Angeles Golden Pig Option • Anaheim East Option

*Note: Additional evaluation needed for Los Angeles 8th Street Option. See Section 6.6 for further details.

The analysis from the previous sections results in a preferred vertical profile shown in Figure 7.1-1. Approximately 48 percent of the corridor is at-grade, 26 percent aerial, six percent trench and three percent fill, with the remaining 16 percent with multiple options. Once the recommendations of this AA are adopted, an updated Project Description will be prepared to document the latest configuration for the project.

Figure 7.1-1 Los Angeles to Anaheim Section – Vertical Profile and Design Options
Dedicated HST Alternative



7.2 CONSOLIDATED SHARED-TRACK ALTERNATIVE

A summary of the subsection design options studied as part of this alternative is presented in Table 7.2-1, listing whether they will or will not be carried forward for analysis in the Draft EIR/EIS.

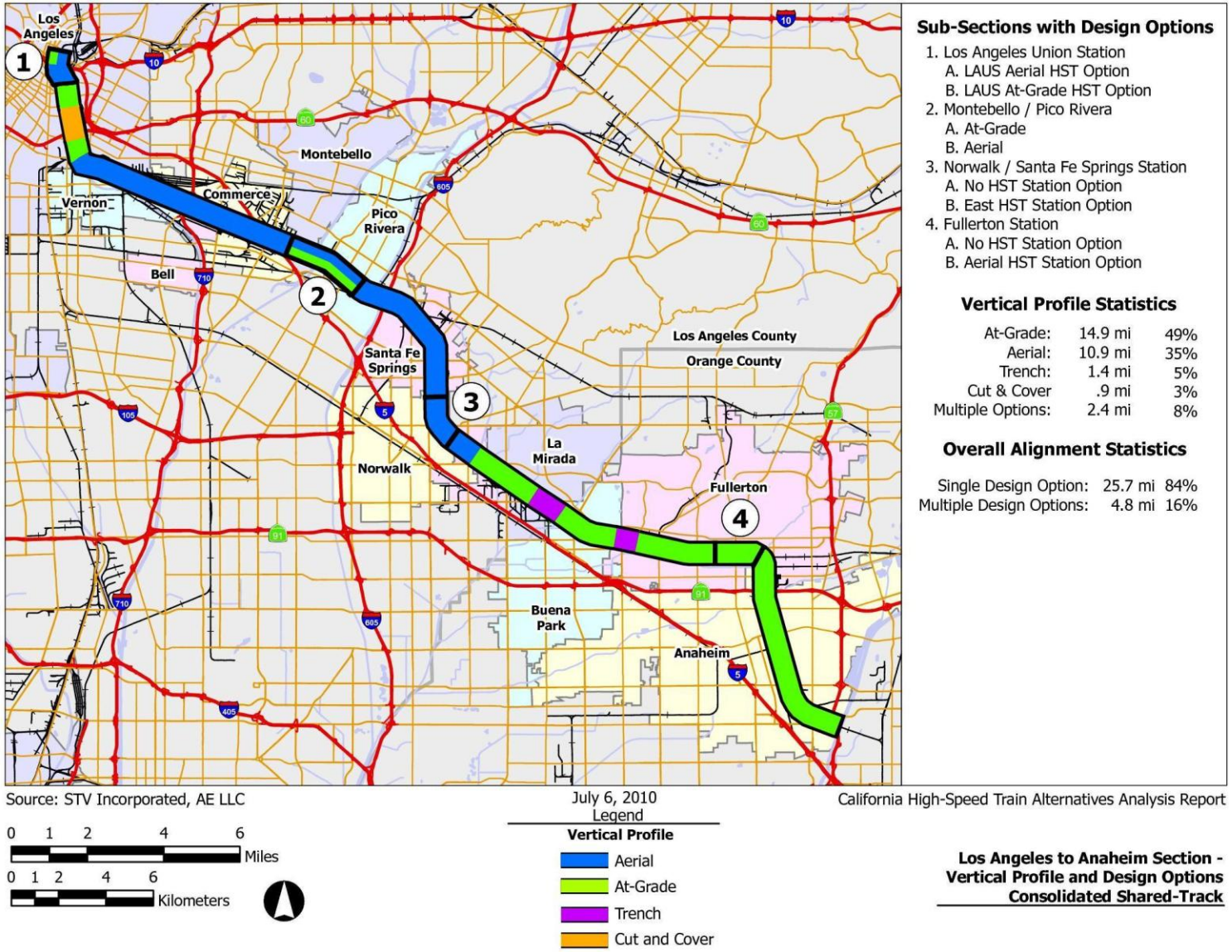
Table 7.2-1 Summary of Consolidated Shared-Track Alternative Subsection Design Options

#	A-LA HST Subsection	Design Options Carried Forward	Design Options Eliminated from Further Consideration
5.1	Los Angeles Station	• LAUS At-Grade HST Station Option • LAUS Aerial HST Station Option	
5.2	Los Angeles River Adjacent	• At-Grade / Cut and Cover Option	
5.3	Los Angeles River Crossing	• Aerial LA River Crossing	
5.4	Montebello / Pico Rivera	• At-Grade Option • Aerial Option	
5.5	Norwalk / Santa Fe Springs Station	• No HST Station Option • East HST Station Option	
5.6	La Mirada Rail Yards	• At-Grade Option	
5.7	Buena Park / Fullerton Airport	• Underpass Option	
5.8	Fullerton	• At-Grade Option	
5.9	Fullerton Station	• No HST Station Option • At-Grade HST Station Option	
5.10	Anaheim	• At-Grade Option	
5.11	ARTIC	• East At-Grade HST Station Option	
6.0	Vehicle Maintenance Facility	• Anaheim West Option • Los Angeles 8th Street Option*	• Los Angeles Golden Pig Option • Anaheim East Option

*Note: Additional evaluation needed for Los Angeles 8th Street Option. See Section 6.6 for further details.

The analysis from the previous sections results in a preferred vertical profile shown in Figure 7.1-1. Approximately 49 percent at-grade, 35 percent of the corridor is aerial, five percent trench, and three percent cut and cover, with the remaining eight percent with multiple options. Once the recommendations of this AA are adopted, an updated Project Description will be prepared to document the latest configuration for the project.

Figure 7.2-1 Los Angeles to Anaheim Section – Vertical Profile and Design Options
Consolidated Shared-Track Alternative



Appendices

Appendix A.....Alternatives Analysis Methods for Project EIR/EIS, Version 2 *(Updated)*
Appendix B.....Los Angeles to Anaheim – Concept Level Operational Feasibility Study
Appendix C.....Program-Level Shared-Track Alternative – Plans
Appendix D.....Expanded Shared-Track Alternative – Plans
Appendix E.....Dedicated HST Alternative – Plans *(Updated)*
Appendix F.....Phase 1 Service Plan
Appendix G.....Alternatives Analysis Methods for Siting Maintenance Facilities *(Added)*
Appendix H.....Consolidated Shared-Track – Letter *(Added)*
Appendix I.....Consolidated Shared-Track – Plans *(Added)*
Appendix J.....LAUS Alignment and Station Locations Considered *(Added)*
Appendix K.....Design Constraints – LAUS to Redondo Junction *(Added)*